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SOME RECENT WORK IN EXPERIMENTAL CANCER RESEARCH*

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The pioneers of cancer research, especially Borrel, were well aware that the study of transplanted tumours is only the study of cells which are already "cancerized," and can throw no light on the complex changes that occur when a cancer forms. It was clearly understood that the aetiology of cancer is divisible into two parts: the causes which lead up to the occurrence of a tumour and the cause which explains the property of the malignant cell. This distinction is not artificial or merely plausible, invented to explain an apparently irrational multiplicity of facts concernng cancer. It is a deduction from general pathological observations, and is now a self-evident conclusion from recent work with carcinogenic agents. Clinically it has long been known that epithelioma of the skin may develop as a consequence of the action of tar, pitch, lubricating oils, or *x* rays on the skin; and that the autonomous growth of the malignant cells is independent of the action of the tar or oil or other causative agent, since the metastases, remote from any possible action of the causative agent, behave as malignant cells. Further, a tumour brought into existence by applying a carcinogenic agent, chemical or physical, can be transplanted indefinitely in normal animals of the same species. Thus the agent which is responsible for starting a tumour plays no further part in the progress of the disease once malignancy has occurred. This distinction between causes which act on normal cells and lead to malignant transformation and the intracellular cause which is responsible for malignancy is not fanciful; it is a necessary deduction from universally accepted facts. Ewing has designated these processes as the "causative genesis" and the "formal genesis" of cancer. The simpler terms "remote causes" and "the proximate cause" are perhaps preferable. Included under the term "remote causes" are the very numerous chemical substances, radiant energy, and gross parasites which have been proved capable of initiating new growths. The second part of cancer aetiology, the proximate cause, gives rise to keenest discussion and will be dealt with later. The advances in our knowledge may be conveniently grouped under these respective terms.

Remote Causes of Cancer

It is now common knowledge that cancer can be started at will by the application of one or other of the "carcinogenic agents." This knowledge has robbed cancer of much of its "mystery" and has helped to create a healthy optimistic outlook in research. It has demonstrated that the sort of investigation which has proved so successful for other diseases can lead to great advances in our knowledge of cancer.

Space does not permit of even a brief survey of the carcinogenic agents. They are already numerous and are being added to every year. In this field of research clinical observation has usually anticipated laboratory experiment. Percivall Pott more than 150 years ago observed that chimney-sweeps suffered excessively from scrotal cancer, and attributed this to soot. That *x* rays may induce epithelioma was proved by the pioneer radiologists, and the causative association of parasites with cancer was observed long ago in bilharzia. Laboratory investigations have amplified and extended these observations. They have led to the preparation of pure chemical substances which can induce cancer formation, and have given rise to fruitful working hypotheses. A whole series of carcinogenic hydrocarbons with a phenanthrene nucleus have been discovered by Professors Kennaway and Cook and their collaborators. One of these compounds, methyl cholanthrene, can be obtained from bile acids by chemical transformations theoretically possible in the body. Moreover, these carcinogenic substances are related chemically to oestrone, to cholesterol, and to other substances which are naturally present in the body. The hypothesis that all cancer-producing substances possess the phenanthrene nucleus is not, however, tenable: Japanese pathologists have been successful in inducing cancer with aniline dyestuffs.

Yoshida has proved that *o*-amino-azo-toluene induces hepatic cancer in rats which are fed with the substance dissolved in olive oil. Kinosita has shown that dimethyl-azo-benzene—"butter-yellow," so called because according to Kinosita it is used commercially as a colouring matter in butter—likewise causes cancer of the liver when fed to rats. He found that 176 mg. fed over a period of fifty days was the smallest dose able to give rise to a hepatoma. These substances, administered by mouth, are probably changed by the liver and excreted in an altered form. Thus *o*-amino-azo-toluene is known to be broken up and eliminated as *p*-acetyltoluylenediamine in the urine. Butter-yellow, fed to rats, is detectable in the liver, and to a less extent in the kidneys and spleen: elimination from the body is not easy, but it is probably broken up and partially excreted as dimethyl-*p*-phenylenediamine.

The induction of cancer by means of oestrone is of exceptional interest because its mode of action has given us a glimpse of what may be described vaguely as an internal carcinogenic environment. The story begins with the study of heredity in cancer, which led to the production by inbreeding of strains of mice in which 70 per cent. or more of the females died of cancer of the breast. Leo Loeb, working with such a strain, showed in 1916 that when very young females were ovariectomized the percentage of cancer fell significantly. His observations were confirmed by Cori and later by W. S. Murray, who

*A summary of a lecture given at the Royal College of Surgeons of England on February 16, 1938.

succeeded also in proving that young males into which ovaries from litter-sisters were grafted may suffer from mammary carcinoma. It was concluded from these experiments that an ovarian hormone is in some way related to the occurrence of cancer of the breast. This conclusion was finally clinched by Lacassagne, who proved that the injection of folliculin in male mice of a cancer strain results invariably in cystic hyperplasia which passes into malignancy. These observations have been confirmed abundantly.

Oestrone, it should be noted, does not cause tumour formation at the site of application: it acts at a distance on an organ, the mamma, with which it is physiologically related. Its mode of action is being closely studied. My colleagues, Drs. Cramer and Horning, have already shown that under its influence complex changes occur in the ductless glands generally. The most conspicuous changes are in the adrenals and the pituitary body. In the adrenals brown degeneration in the zone between medulla and cortex takes place. The pituitary body, after an early period of hyperaemia, becomes greatly enlarged and congested, and frequently adenomas composed of chromophobe cells are found.

Cramer and Horning deduced from their studies of these phenomena that one or more of the hormones of the anterior lobe are capable of neutralizing the effects of oestrone on the pituitary gland. They proved by careful experiment that the thyrotropic hormone has this power. Injected weekly it keeps in check the mammary and pituitary changes produced by prolonged oestrinization, and in female mice having a high incidence of mammary cancer it prevents the spontaneous development of cancer of the breast.

The Proximate Cause of Cancer

It has already been pointed out that a tumour which has been started by applying one or other of many agents, chemical or physical in nature, may be propagable through an unlimited series of normal animals, and that the continued growth and multiplication of the malignant cells is independent of the action of the agents used in starting the tumour. How can we explain the change that has taken place within a cell when malignancy occurs? Verbal explanations are easy. It might be said that the cell has undergone "an irreversible change"; and doubtless a term of this kind, giving as it does an air of scientific validity, might prove satisfactory to chemists or physicists, who are accustomed to working with comparatively simple material under well-regulated conditions. But the explanation carries us no further. Similarly a solution of the problem might be conveyed by suggesting that the malignant cell is a somatic mutant. Such an explanation again is merely verbal. It has no factual basis, it ignores some well-established facts, it is arrived at by the dangerous process of reasoning by analogy, and it offers no prospect of further advances in knowledge. It is unprofitable to spend time in considering such explanations. I shall confine my attention to the view that a virus may be the proximate or intimate cause of malignant growths. The reason for doing this is that there are many tumours in which a virus cause has been established, and this fact gives a feeling of security that we are not living in regions of pure speculation.

Mode of Action of a Tumour Virus

First of all it must be made clear that the mode of action of a tumour virus is different from the action of carcinogenic agents. The virus acts promptly, is specific both to the animal and to the tissue, and can be recovered again from the tumour which follows inoculation. With a filterable tumour like the Rous sarcoma No. 1 or the Imperial Cancer Research Fund's strain of endothelioma known as Mill Hill No. 2, tumour formation begins in a week or less after inoculation; each virus produces only its own tumour in only one species of animal; and the virus increases in amount with the growth of the tumour. When a tumour is started with the most active of carcinogenic agents—with benzpyrene, for example—the story is quite different. In the first place, the time interval between application of the chemical substance and the appearance of a tumour is, even in the most sensitive animals, a matter of months. In the second place, the kind of tumour produced depends upon the site of application: if the skin is painted a squamous carcinoma results, but if the substance is injected into the subcutaneous tissues a sarcoma follows. There is no specificity of action. And, in the third place, the chemical substance, though present in the primary tumour, is not necessary to the growth of the tumour and is not recoverable from remote generations of transplants. It is puzzling to understand how it comes about that viruses are so often classed with the carcinogenic agents when their mode of action is so manifestly different.

I must now hasten to state that the tumours for which a virus cause has been established are comparatively few in number; or, rather, are almost confined to birds. They consist of tumours of the domestic fowl, a rabbit papilloma which goes on to malignancy, and an adenocarcinoma of the kidney of a certain species of frog. Other tumours may assume a filterable phase, as Parsons has shown for a mouse sarcoma which had been induced by injections of a complex hydrocarbon. The great majority of tumours used in experimental research—tumours of mice, rats, guinea-pigs, dogs, etc.—can be propagated only with living cells. If attention is restricted to these it must be observed that nothing could appear more improbable than the notion that these tumours are caused by an intracellular virus. They give no evidence of any sort that a virus is at work. It is largely because of this that the majority of pathologists have until recently paid scant attention to viruses in cancer. At present, it is fair to remark, most workers in cancer would agree that any coherent explanation of cancer must include an explanation of the filterable tumours.

The division of tumours into two kinds—those which can and those which cannot be transmitted by cell-free extracts—is one of the major puzzles of experimental cancer research. Why some tumours readily yield an infective agent and others subjected to the same treatment should give innocuous extracts is at present inexplicable. But recent work has shown that failure to demonstrate an intracellular causative agent by direct means—that is, by serial transmission of tumours with non-cellular material—must not be interpreted too dogmatically. This conclusion is supported by two pieces of research—one by Foulds, who worked with a dibenzanthracene tumour of a fowl, and the second Peyton Rous's revolutionary work with the Shope papilloma.

Foulds's Work with Non-Filterable Dibenzanthracene Tumours

The tumour studied by Foulds is a fibrosarcoma of the domestic fowl. It was brought into existence by injecting a hen with a solution of dibenzanthracene in lard.* The original purpose of inducing a tumour in this way was to determine whether an artificially induced tumour is trans-

* The dibenzanthracene was generously provided by Professor Kennaway.

missible with cell-free extracts. The object of the work was, in other words, to put to the test of experiment the thesis that dibenzanthracene or similar agents act upon cells by sensitizing them to the action of a virus. It may be stated at once that all attempts to transmit this tumour with cell-free extracts have failed, though it can be propagated fairly easily with living cell grafts. In some of the experiments in which these tests were made it is not even justifiable to use the term "cell-free extract," for it has repeatedly been found that a saline extract which has been spun for a few minutes at 5,000 revolutions is incapable of giving rise to a growth. This artificially induced sarcoma therefore differs in no wise from tumours of mice and rats. It has one great advantage as material for experimental study, since it is possible to test in an indirect way whether the cells, though providing no direct evidence of the presence of a virus, do or do not contain an antigen related to the infective agents of filterable fowl tumours. We cannot make such tests with either spontaneous or artificially induced tumours of rats and mice because we have no filterable rat or mouse tumours to provide virus to test immune sera. The experiments carried out by Foulds were briefly as follows. Rabbits were bled in order to obtain samples of normal serum and were then injected repeatedly with Berkefeld filtrates of the dibenzanthracene tumour. After a time it was found that the sera of the rabbits acquired an antibody which neutralized completely the virus of the Rous sarcoma. This was proved by mixing the serum with active filtrates of the Rous sarcoma, the control being a similar mixture of active filtrate and serum taken before the immunizing injections were made; the mixtures were incubated at 37° C. for an hour and then injected in different sites of four chickens. In the sites where mixtures containing immune serum were placed no tumours developed, whereas in the control sites large rapidly growing Rous sarcomas formed.

It is clear from the experiments, which have been fully described by Foulds (*Amer. J. Cancer*, 1937, **31**, 404), that although a filtrate of the dibenzanthracene tumour is inactive—that is, is unable to provoke tumour formation—it nevertheless contains an antigen which is capable of giving rise to antibodies that readily neutralize the virus of the Rous sarcoma. That this antigen is not some indefinite component of normal chicken tissues was proved in several ways—for example, by attempting and failing to absorb the antibody by means of chicken tissue, and by attempting and failing to produce a similar antibody by injecting rabbits with extracts of normal chicken tissues. There is therefore something closely related to the infective agent of the Rous sarcoma in these inactive filtrates of a dibenzanthracene tumour. Whether it is a virus or part of a virus we do not yet know. For the present it is sufficient to emphasize that these experiments are a warning against too confident and too dogmatic conclusions which may be drawn from negative results of filtration experiments.

A comment on criticisms of this work may be allowed before passing on to a brief account of work on rabbit papillomas. It has been objected that the virus which is present in the dibenzanthracene tumour may be merely carried in the tumour passively, as a passenger is carried in a train—that it is unrelated causatively to the tumour. The foundation of this criticism lies in the well-known fact that viruses can be made to lodge in tumour growths—for example, the virus of vaccinia can be carried by mouse tumours. It is inferred from this fact that it is possible, if not probable, that a dibenzanthracene tumour growing in a chicken attracts virus which may normally exist in chicken tissues and provides suitable conditions for the existence, and presumably for the growth and multiplication, of the virus. If this were so the production of immune sera by the methods employed would be misleading. This criticism is not relevant to the facts. It is sufficient to point out some obvious differences between the two cases. We prove that vaccinia virus is being carried in a mouse tumour by showing that an extract of the tumour causes vaccinia; we cannot prove that the virus of the Rous sarcoma is present in the dibenzanthracene tumour by causing a Rous tumour with extracts: the extracts are completely harmless. The recognition of the supposed virus in the dibenzanthracene tumour is dependent on its resemblance to a tumour-producing virus. Further, when the dibenzanthracene tumour is artificially contaminated by the virus of the Rous tumour the contamination is recognizable by injecting chickens with a cell-free extract of the tumour, when a Rous sarcoma is produced. This fact, which we owe to Sir Edward Mellanby, pretty well disposes of the theoretical objection under discussion.

Rous's Work on the Shope Papilloma

We can now turn to the work of Peyton Rous on the Shope papilloma. This tumour was discovered by Dr. R. E. Shope on the skin of a cotton-tail rabbit. Shope found that the tumour is transmissible with filtrates and with glycinerated tissue both in cotton-tail and in domestic rabbits. The skin is shaved and then scarified as in vaccinating a person with calf lymph, and a filtrate or extract of glycerinated tissue is rubbed into the scarified area. After two to four weeks small translucent papillomas appear; they grow and eventually form large cauliflower-like masses of tissue. In cotton-tail rabbits the tumour can be transmitted in an endless series in this way, but in domestic rabbits, although the papilloma in them is larger and more fleshy as well as more aggressive in character, it has been found as a rule that transmission beyond the first generation is not possible. Thus the papilloma can be started in domestic rabbits, but thereafter the virus appears to be lost. Shope, however, has succeeded during the last few years in separating a strain of the virus which can, with some difficulty, infect domestic rabbits serially. There are now in most laboratories two strains—the "cotton-tail strain" and the "domestic rabbit strain."

The aggressive character of the papilloma in domestic rabbits, already referred to, is indicated by the frequency with which it becomes malignant. Experience in the laboratories of the Imperial Cancer Research Fund is that almost all Shope papillomas in domestic rabbits become malignant within two years. If the primary papilloma is very large malignancy may supervene within six months. In the cotton-tail rabbit, on the contrary, the papilloma rarely passes into carcinoma; Professor Berry of Rochester University has observed a case and Peyton Rous several out of hundreds of papillomas.

The position has thus been reached that a papilloma of the rabbit, caused by a virus, regularly passes into a state of malignancy. The carcinoma invades tissues locally and neighbouring lymph nodes and internal organs, especially the lung, leading to the death of the host animal. Is the virus the cause of the malignant growth also? If a cell-free filtrate of the growth would start a new malignant growth then the conclusion that the virus is the cause would be incontestable. But this is not so. Filtrates are completely inactive. It appears superficially that as soon as the papilloma becomes an invading true malignant neoplasm the virus disappears, and we are confronted with the same apparently insoluble problem presented by the generality of mammalian cancers.

Again we have to seek indirect evidence. Peyton Rous succeeded in propagating the carcinoma through two generations of rabbits by the process of grafting fragments of living carcinoma cells taken, in order to avoid the possibility of including papilloma cells in the inoculum, from an "infected" lymph node. As the implanted cells grew to form "daughter tumours" it was found that the blood serum of the rabbits acquired an immune body which neutralizes the papilloma virus. The conclusion which must be drawn from these observations is that, although filtration experiments with the carcinoma give negative results, the carcinoma cells do nevertheless carry the papilloma virus. The final proof that the virus acts causatively is more difficult, though it is fair to observe here that if we were now discussing any other subject than cancer the prima facie evidence that the virus is acting as the cause of the pathological condition under investigation would be scarcely questioned. At least it may be said that the negative filtration results do not warrant the conclusion that the papilloma virus is absent. It is very probable, indeed almost certain, that conditions exist within the cells of the tumour under which a virus-protoplasm complex is formed and that filterability may depend upon an easy or a particular dissociation of the complex.

Relation Between Carcinogenic Agents and Viruses

Passing now to the relation between the action of carcinogenic agents and viruses, it is necessary to discuss an experiment with coal tar and papilloma virus carried out by Peyton Rous. When coal tar is applied once a week to the skin of a rabbit's ear papillomas form after a few months, the time depending upon the quality of the tar. Some of the papillomas may, after a much longer time—a year or more—become malignant. The experiment carried out by Rous was as follows:

> A series of rabbits were painted with coal tar for about three months, when small papilloma began to appear. Some of the rabbits then received intravenously an injection of virus obtained from a papilloma of the cotton-tail rabbit. Painting the ears with tar was continued on all the rabbits, control and experimental alike. After two to three weeks—the incubation period usually observed with the virus in its action on the skin—the tarred areas in those rabbits which had received virus developed true anaplastic rapidly growing squamous carcinomas. The cancers appeared both at the sites of papilloma formation and on tarred areas devoid of papillomas. No cancers appeared on areas that had not been tarred. The control rabbits, which had been treated with tar only, showed no cancer at the time nor later, a long while after the others had died of generalized cancer.

This experiment has been repeated and confirmed, and has excited world-wide interest. Like so much work of Peyton Rous it goes to the heart of the problem. It will doubtless be subjected to criticisms similar to those already discussed in dealing with Foulds's work with non-filterable dibenzanthracene tumours—namely, that it is possible to cause viruses of all sorts to lodge in tumour growths. But these criticisms are invalid; for, as Rous himself has pointed out, when a virus such as Virus III is carried as a contaminant in a transplantable rabbit carcinoma the virus has no effect on the tumour, whereas in his experiment the Shope virus causes quickly a definite specific change in the tar lesion, and the change corresponds with changes which it is known that the virus may induce slowly under normal and presumably less favourable conditions. It is more reasonable to look upon the action of tar as being of a preparatory kind, as affecting the cells in such a way as to render them very susceptible to the action of the virus. If this view is correct—and it certainly is in conformity with the fact that carcinogenic agents like tar have a fundamentally different mode of action from that of a virus—it permits us to postulate as a working hypothesis that when a tumour is induced in an animal by applying carcinogenic agents the vital change from hyperplasia to malignancy is probably associated with the entry of a virus. This presupposes the widespread existence within the animal body of viruses of low infectivity but capable, when suitably conditioned, of entering cells and setting in motion the train of events described as cancer. Some difficulty is felt in accepting the supposition, but it can be pointed out that where it is possible to make experiments capable of yielding information some supporting evidence has been found. Thus it is now known, following the first observations by Pentimalli, that immune bodies which neutralize the viruses of avian neoplasms appear in the blood in a high percentage of apparently normal fowls more than 18 months old. These immune bodies are presumably formed in response to a virus related to or identical with the viruses found in actual neoplasms.

An outline of cancer work in progress must necessarily be incomplete; each section could be expanded into several lectures. But I hope I have given evidence that progress is being made in many directions and that what has been done already justifies us in our optimism.

VITAMIN C DEFICIENCY IN PEPTIC ULCERATION AND HAEMATEMESIS

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Although frank clinical scurvy rarely follows the modern conservative methods of dietetic treatment of peptic ulceration (Davidson, 1928; Barling, 1935; Wood, 1935; Platt, 1936) it is now being realized that early "prescorbutic" or "subclinical" states may occur quite frequently. The experimental evidence put forward by McCarrison (1919, 1931), Magee *et al.* (1929), McConkey (1933), and Smith (1933) shows that ulceration of the stomach and duodenum is very apt to occur in animals in a state of vitamin C deficiency, while the importance of vitamin C in the normal reparative processes has been further emphasized quite recently by Lanman and Ingalls (1937), who have shown that a deficiency of this vitamin is a potent factor in delayed wound healing.

Harris *et al.* (1936) found that nineteen patients with peptic ulcers had distinctly subnormal daily urinary excretions of ascorbic acid, but in that particular inquiry 84 per cent. of all the patients examined showed subnormal daily urinary excretion values. An important contribution was that of Archer and Graham (1936), who showed that six out of nine patients with peptic ulcers, for which they were receiving dietetic treatment, were in the "subscorbutic" state. In the course of our investigations we have had the opportunity of examining the

vitamin C metabolism in a series of patients with gastro-intestinal ulceration, and these form the basis of the present report.

Test Subjects and Patients

The 107 subjects employed in these tests are divided quite easily into four distinct groups:

Group I.—A control group consisting of twenty-six members of the departmental staff and medical students; all gave excellent dietary histories, including a good supply of vitamin-C-containing foods.

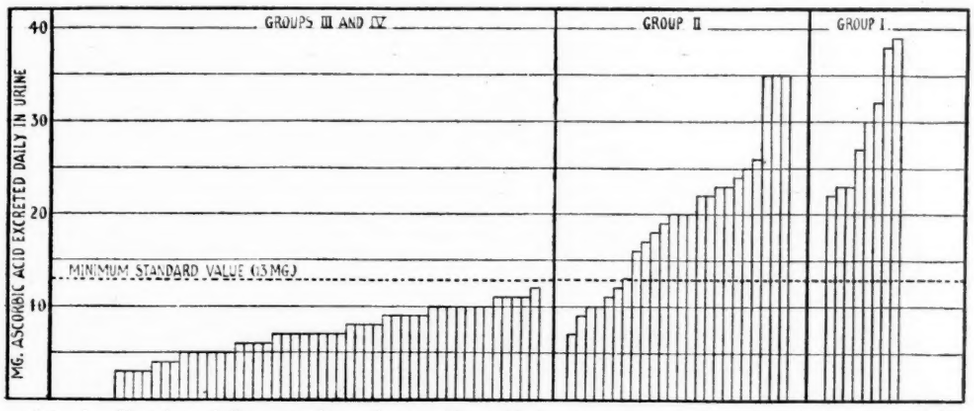

FIG. 1.—Showing daily excretion of ascorbic acid in normal controls and patients with peptic ulcers with and without haematemesis.

Group II.—A control group consisting of twenty-five miscellaneous patients chosen at random from the Infirmary wards, excluding those with gastric or renal disease; these were taking standard hospital diets and gave dietary histories varying from "good" to "poor," the greater number being in the "good" category.

Group III.—In this group were twenty-five patients suffering from proved peptic ulceration but without haematemesis, and they were all receiving special diets of the Hurst No. 1 and No. 2 types, or modifications of them.

Group IV.—This group contained thirty-one patients who were admitted to hospital on account of severe haematemesis—attributed to peptic ulceration. They had all been on very poor diets, and were put on special diets (mostly of the Hurst No. 1 type) on admission to hospital.

Methods of Investigation

Six methods were used for the determination of vitamin C deficiency in these subjects; they are considered under their respective headings: (1) the daily urinary excretion of ascorbic acid; (2) the ascorbic acid "saturation" test; (3) plasma ascorbic acid determinations; (4) oral ascorbic acid tolerance tests; (5) intravenous ascorbic acid tolerance tests; and (6) the intradermal test.

Technique and Results

1. THE URINARY EXCRETION OF ASCORBIC ACID

This was carried out by the method of Harris, Ray, and Ward (1933), which is a modification of Tillmann's 2:6-dichlorphenolindophenol method, the urine being collected every twelve hours and titrated against the dye. The special precautions for collecting, storing, and titrating the urine were rigidly observed. The minimal normal amount of ascorbic acid excreted in twenty-four hours as determined by this method is about 13 mg., and this figure has been adopted here. (Harris *et al.*, 1936.)

The control subjects in Group I all excreted more than the minimal normal daily amount of 13 mg. of ascorbic acid (22 to 39 mg.), the mean daily excretion being 29 mg. In nineteen patients (76 per cent.) of the second group of twenty-five control patients who had been selected at random, similar daily excretions were obtained, while the remaining six patients (24 per cent.) in this group who gave poor dietary histories excreted less than 13 mg. daily; the mean daily excretion for the whole of Group II was 17 mg. (7 to 35 mg.). All the patients in Group III excreted less than 13 mg. ascorbic acid daily, with a mean of 7 mg. and a range of 5 to 11 mg.; similar values (mean 7 mg., range 5 to 10 mg.) were obtained with the patients in Group IV. (See Fig. 1.)

2. THE ASCORBIC ACID "SATURATION" TEST

This test is a modification of that described by Abbasy *et al.* (1935). The average daily excretion of ascorbic acid was determined over a period of about six days; at the end of this period a dose of ascorbic acid (500 to 1,000 mg.) was given orally, and the amount excreted in the urine in the subsequent twenty-four hours was estimated as in the first method. If the urinary concentration of ascorbic acid did not show any increase following this dose the latter was repeated daily until "saturation" was reached.

Most of this test dose of ascorbic acid is retained by the body stores in a deficient patient, and in many cases there is no increase in the initially low urinary excretion; in a "saturated" patient, however, a large percentage of the administered ascorbic acid is excreted, the well-filled body reserves being able to dispense with the surplus. Since several different standards have been employed by other workers we have taken an excretion of 50 per cent. of an oral test dose as evidence of "saturation." The types of result so obtained are shown in Fig. 2, where it will be seen that, in contrast with

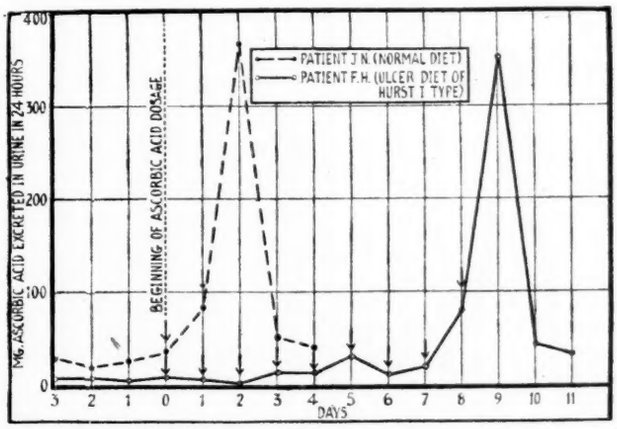
PATIENT J.N. (NORMAL DIET)
PATIENT F.H. (ULCER DIET OF HURST I TYPE)
BEGINNING OF ASCORBIC ACID DOSAGE
MG. ASCORBIC ACID EXCRETED IN URINE IN 24 HOURS
400
300
200
100
0
3 2 1 0 1 2 3 4 5 6 7 8 9 10 11
DAYS

FIG. 2.—Illustrating the difference in dosage of ascorbic acid required to saturate individuals taking normal and ulcer diets. The oral administration of 500 mg. of ascorbic acid is indicated by an arrow.

the normal patient (J. N.), who required 1,000 mg., much larger quantities (4,500 mg.) of ascorbic acid were necessary to produce "saturation" in patient F. H., who took nine days before saturation occurred, while receiving 500 mg. ascorbic acid daily.

Using this method we find that test doses of 500 to 1,000 mg. of ascorbic acid produce saturation in the Group I controls, while 700 to 2,300 mg. (mean 1,252 mg.) were given before saturation was reached in Group II control patients. On the other hand, in the ulcer patients under examination 2,100 to 5,000 mg. (mean 3,691 mg.) of ascorbic acid were given in Group III and totals of 2,000 to 8,000 mg. (mean 4,543 mg.) in Group IV before "saturation" was reached, figures greatly in excess of the average values required in the two control groups (see Table III).

3. PLASMA ASCORBIC ACID DETERMINATIONS

The blood contains ascorbic acid in the reduced and the oxidized forms, the greatest amount occurring in the reduced form. This reduced ascorbic acid content of plasma can readily be determined by Pijoan and Klemperer's modification (1937) of the method of Farmer and Abt (1935); values between 0.66 and 2 mg. reduced ascorbic acid per 100 c.cm. plasma are regarded by these workers as normal, and closely coincide with our own findings. The total ascorbic acid content of blood can be determined by the method of Mirsky *et al.* (1935), and these values have also been determined in our cases. From our own experience and that of Farmer and Abt we believe the reduced ascorbic acid content of plasma to be much more important and accurate than the total ascorbic acid in assessing the state of the body with regard to vitamin C. Since the total blood ascorbic acid values add nothing to the present discussion we propose to omit them from this paper. In individuals on a good vitamin-C-containing diet we found the plasma ascorbic acid lay between 0.60 and 1.85 mg. per 100 c.cm. In the patients of Groups III and IV values between 0.14 and 0.59 mg. per 100 c.cm. were obtained, and in Group IV the mean (0.34 mg. per 100 c.cm.) was lower than that of Group III (0.42 mg. per 100 c.cm.).

It must be remembered that while the reduced ascorbic acid content of plasma gives at a single estimation a fair index of the state of the tissues in relation to vitamin C, yet it is subject to fairly rapid fluctuations, and a subnormal plasma ascorbic acid may occasionally be found although no gross deficiency can be proved by other tests. A case illustrative of this was that of a patient with a plasma ascorbic acid content of 0.54 mg. per 100 c.cm. who required only the comparatively small dose of 1,000 mg. ascorbic acid orally before "saturation" occurred. This finding of a low plasma ascorbic acid in spite of adequate reserves is explained by the fact that the plasma ascorbic acid falls rapidly in a few days on a vitamin-C-deficient diet, although there will not be as yet any marked decrease in the tissue content of ascorbic acid. On the other hand, the finding of a normal or high plasma ascorbic acid shows the patient to have good reserves of the vitamin (always assuming that a large dose of vitamin-C-containing food has not been taken before the test begins), and a single estimation should be sufficient without corroborative evidence from other tests.

It should be mentioned that we find the plasma ascorbic acid to be very constant from hour to hour on a non-supplemented diet. We also find that in the normal patient taking an adequate supply of vitamin C in the diet there is very little variation in plasma ascorbic acid from day to day.

4. THE ORAL ASCORBIC ACID TOLERANCE TEST

We investigated the possibility of using the changes in the plasma ascorbic acid after an oral test dose of ascorbic acid as a means of detecting vitamin C deficiency. This "oral ascorbic acid tolerance test," as we have called it, is carried out in the following manner:

The patient is not given any extra vitamin-C-containing foods, other than the ordinary hospital diet, on the day before the test. Five c.cm. (10 c.cm. if the total ascorbic acid is also to be estimated) of blood are withdrawn from a convenient vein at hourly intervals for four hours, and the reduced ascorbic acid value of the plasma is determined. This preliminary test acts as a control to show the constancy of the blood ascorbic acid level on a non-supplemented normal diet. At 9 a.m. the following day the ascorbic acid content of the blood is again determined and 1,000 mg. of ascorbic acid administered orally in the form of twenty redoxon tablets (one tablet equals 50 mg.); 5 or 10 c.cm. of venous blood are then taken every hour for five hours and the blood ascorbic acid values redetermined. The patient is instructed to void urine as nearly as possible at each hourly interval, such sample being titrated at once.

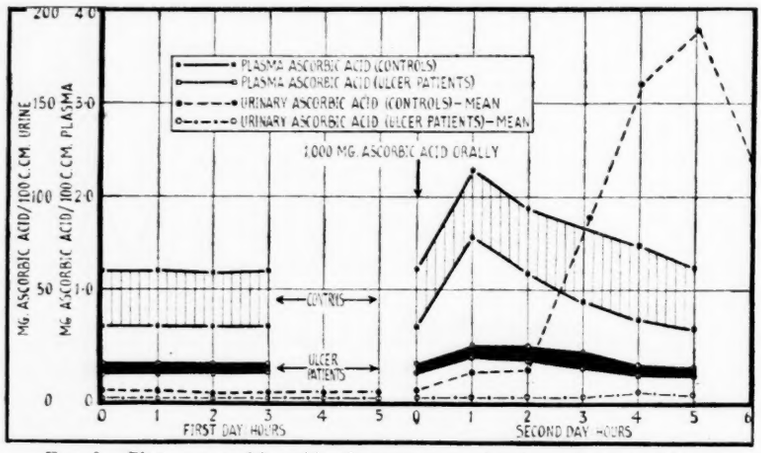

FIG. 3.—Plasma ascorbic acid tolerance tests, showing effect of 1,000 mg. ascorbic acid given orally to normal controls and patients with peptic ulceration; the corresponding mean urinary values are also shown.

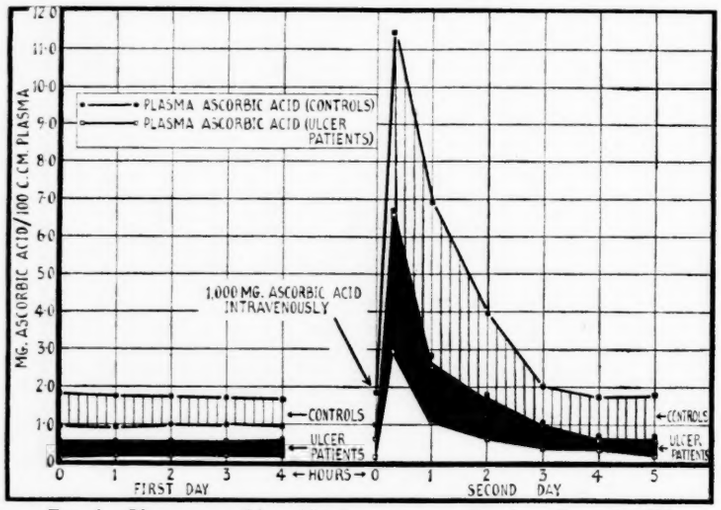

FIG. 4.—Plasma ascorbic acid tolerance tests, showing effect of 1,000 mg. ascorbic acid given intravenously to normal controls and patients with peptic ulceration.

In Fig. 3 typical curves for the highest and lowest limits are shown to illustrate (*a*) normal controls on diets containing an adequate amount of vitamin C, and (*b*) patients on vitamin-C-deficient diets (for example, Hurst No. 1 ulcer diet).

Using the oral method as described above, the controls of Groups I and II had initial plasma ascorbic values above 0.80 mg. per 100 c.cm. Apart from slight initial differences, which were within the normal limits, the results were practically identical in Groups I and II, and they therefore may conveniently be considered together. After the administration of the test dose of 1,000 mg. of ascorbic acid orally, the plasma ascorbic acid values in both groups showed rapid increases in the first two hours to peaks of 1.80 to 3.50 mg. per 100 c.cm., followed by returns to the initial plasma levels at the end of five to six hours.

Simultaneously with these blood changes it was noticed that the urinary concentration of ascorbic acid showed an increase maximal at four to six hours and an increase in the total amount excreted in the urine at that time. During the entire twenty-four hours from the beginning of the test approximately 500 mg. (50 per cent. of the test dose) of ascorbic acid was excreted in the urine.

When, however, we turn to Groups III and IV very different results were noticed. Here also the two groups of patients can be considered together, owing to the similarity in plasma ascorbic acid titres. The low initial ascorbic acid values (Group III below 0.41 mg. and Group IV below 0.34 mg. per 100 c.cm.) showed very slight alterations, increasing only to 0.48 to 0.60 mg. per 100 c.cm. in one to two hours after the test dose. The urinary concentration during this test showed little or no increase, and in the subsequent twenty-four hours the excretion of ascorbic acid was much less than 500 mg., while quite often no increase at all was noted, even in the total twenty-four-hour specimen. (See Fig. 3.)

While these oral tolerance curves give accurate results the criticism might be made that variation in absorption from the gastro-intestinal tract, together with other factors causing destruction of the vitamin there, might affect the results; the same criticism could be made of the "saturation" test. To eliminate this possibility an intravenous method of applying the ascorbic acid tolerance test was introduced.

5. THE INTRAVENOUS ASCORBIC ACID TOLERANCE TEST

This consists in estimating the rise in plasma ascorbic acid after the administration of ascorbic acid intravenously, as follows:

The day preceding the test a control experiment is carried out as in the oral tolerance test. At 9 a.m. on the following day a sample of blood is taken as before, and then 1,000 mg. of ascorbic acid are given intravenously in the form of redoxon forte (10 c.cm. = 1,000 mg.). As our experiments showed that the plasma ascorbic acid begins to rise very rapidly after the injection, the next specimen of blood is taken fifteen to twenty minutes later (it was convenient in this series to take the first sample at eighteen minutes), and then further venous blood samples at hourly intervals after the injection of ascorbic acid for a period of five hours, the plasma ascorbic acid being determined in each. The urine is collected hourly and titrated immediately, as in the oral tolerance test above.

In the normal group of subjects the plasma ascorbic acid rises to very high levels in the first fifteen to twenty minutes, but in the deficient group the rise is not so marked (typical results are seen in Fig. 4 and Table I). The urinary concentration of the ascorbic acid increases rapidly to higher levels in the normal than in the deficient group, and is usually maximal at the end of one to two hours.

TABLE I.—*Intravenous Tolerance Tests. Showing the Results Obtained in Patients with the Highest, Middle, and Lowest Initial Plasma Ascorbic Acid Values in Groups I and II, III and IV*

		Ascorbic Acid, mg. per 100 c.cm. Plasma after Injection of 1,000 mg. Ascorbic Acid Intravenously						
		0 hr.	18 min.	1 hr.	2 hrs.	3 hrs.	4 hrs.	5 hrs.
Groups I and II	Highest ..	1.85	11.40	6.94	4.00	2.21	1.84	1.85
	Middle ..	1.21	9.40	6.00	2.99	1.78	1.45	1.24
	Lowest ..	0.70	6.60	2.84	1.74	1.10	0.70	0.72
	Mean ..	1.20	10.12	5.62	2.76	1.63	1.55	1.22
Groups III and IV	Highest ..	0.59	6.90	2.66	—	0.98	0.68	0.60
	Middle ..	0.38	5.64	1.99	1.10	0.81	—	0.48
	Lowest ..	0.14	2.89	1.09	0.68	0.42	0.31	0.29
	Mean ..	0.36	4.45	1.69	1.05	0.76	0.51	0.42

We find that it is better to take account of the *amount* excreted in the six hours following injection of the test dose rather than the *concentration*, since from previous experiments at least 500 mg. of the 1,000 mg. test dose was excreted in the urine in the subsequent twenty-four hours in normal controls, and approximately 80 per cent. of this twenty-four-hour ascorbic acid excretion—that is, 400 mg.—was excreted in the first five to six hours following the intravenous administration of the test dose. These urinary excretions are illustrated in Fig. 5. It thus appears probable that the amount excreted in the first five to six hours after the injection may be an accurate index of the body saturation with respect to vitamin C. (While these experiments were in progress our views were confirmed in a valuable paper by Wright, Lilienfeld, and McLenathen (1937), using a similar method.)

In our control groups (I and II) the results were very similar, and can be classified together as in the case of the oral tolerance curves. The initially high plasma ascorbic acid values (0.70 to 1.41 mg. per 100 c.cm. in this test) rose very rapidly to maxima of 6.6 to 11.4 mg. per 100 c.cm. in the fifteen to twenty minutes after the intravenous administration of the 1,000 mg. test dose of ascorbic acid; this was followed by a progressive fall during the subsequent five to six hours to the initial blood level. In the twenty-four hours after the injection not less than 660 mg. (660 to 985 mg.) of the 1,000 mg. test dose of ascorbic acid was excreted in the urine, and at least 500 mg. (549.3 to 934 mg.) was excreted in the first five hours following the injection, representing 83 to 95 per cent. of the total amount excreted. (See Figs. 4 and 5 and Table II.) Slightly less ascorbic acid was excreted in the urine in the full twenty-four hours in Group II patients than in those of Group I.

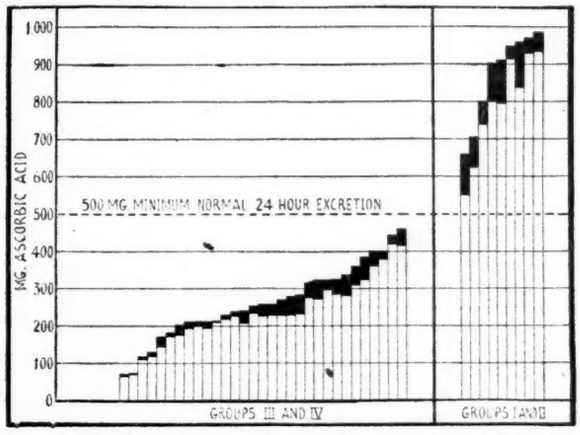

FIG. 5.—Showing amount of ascorbic acid excreted following a single intravenous dose of 1,000 mg. ascorbic acid. Each column represents the amount excreted in the twenty-four hours, and the unshaded portion shows the amount excreted in the first five hours.

In the two groups of ulcer patients with and without haematemesis (Groups III and IV) this intravenous tolerance test gave results which can also be conveniently considered together. The low initial plasma ascorbic acid values (0.14 to 0.59 mg. per 100 c.cm.) rose in the first fifteen to twenty minutes after the injection to values of 2.00 to 7.01 mg. per 100 c.cm., but on the whole the lower values were noted in the group of patients with haematemesis. In contrast to Groups I and II the amount of ascorbic acid excreted in the urine by these patients in the twenty-four hours was well below 500 mg. (72 to 458 mg.), although, as before, at least 80 per cent. (64 to 418 mg.) of the total excretion in twenty-four hours was excreted in the five hours immediately after injection (Table II). Thus from our results it is clear that a good estimation of the vitamin C nutrition of the body can be obtained by estimating the amount of ascorbic acid excreted in the urine in the first five hours after injection, since at least 80 per cent. of the twenty-four-hourly amount is excreted in that time. Apart from eliminating alterations of the vitamin in the alimentary tract this method is particularly suitable for hospital use, where the daily collection of urine entails considerable work for the nursing staff.

6. INTRADERMAL TEST

In April, 1937, Rotter suggested a test for vitamin C deficiency which depended upon an observation that a solution

of 2:6-dichlorphenolindophenol, when introduced intradermally, is decolorized at a speed dependent upon the degree of vitamin C saturation of the tissues. We therefore compared this intradermal test with the results obtained with the five methods described above in a series of 103 patients, and have already published our technique and results (Portnoy and Wilkinson, 1938). From the preliminary figures it appears that individuals who are on a "good" diet with regard to the vitamin give decolorization times of less than ten minutes, while those taking large amounts of vitamin C in their food give decolorization times below five minutes. On the other hand, prolongation of the decolorization time over ten minutes is suggestive of a lack of vitamin C in the tissues.

TABLE II.—*Plasma Ascorbic Acid Values and Excretion after Test Dose of 1.000 mg. Intravenously*

	Plasma Ascorbic Acid, mg./100 c.cm.		Mg. Ascorbic Acid Excreted in Urine in 24 Hours	Ascorbic Acid Excreted in Urine in 5 Hours	
	Before Test Dose	18 Minutes after Test Dose		Mg.	% of 24 Hours' Excretion
Groups I and II	1.85	11.40	950.0	918.0	95
	1.41	10.90	980.0	934.0	95
	1.41	11.40	960.0	840.0	87
	1.39	9.99	902.8	802.8	88
	1.30	11.20	985.9	—	—
	1.21	9.40	973.1	927.5	95
	1.10	9.86	800.0	740.0	92
	0.90	—	704.2	623.2	88
	0.79	10.20	912.0	792.0	86
	0.70	6.60	659.3	549.3	83
Groups III and IV	0.59	6.90	440.0	418.0	92
	0.50	7.01	458.7	417.7	91
	0.50	6.00	400.0	380.0	95
	0.50	5.30	360.0	310.0	86
	0.49	6.08	253.7	231.7	91
	0.48	5.60	401.0	361.0	87
	0.48	6.60	332.0	280.8	84
	0.43	4.20	169.0	148.5	88
	0.42	4.74	319.0	276.0	86
	0.40	4.00	324.9	282.9	87
	0.40	6.30	238.0	227.0	95
	0.39	5.81	118.4	110.4	93
	0.38	4.00	322.1	291.2	87
	0.38	2.64	323.0	272.0	84
	0.38	5.64	229.0	217.0	94
	0.33	3.96	214.0	210.0	98
	0.31	—	210.0	196.0	93
	0.31	4.00	73.0	70.4	96
	0.30	3.40	384.1	324.1	84
	0.30	2.00	278.0	229.0	82
	0.30	4.60	241.0	207.0	81
	0.30	2.45	210.0	199.0	94
	0.30	3.98	181.48	172.48	95
	0.30	4.12	72.25	64.25	88
	0.29	4.00	258.8	228.8	88
	0.24	2.87	282.3	235.2	83
	0.21	3.60	201.39	176.29	89
	0.20	3.10	269.0	229.0	87
	0.20	3.21	130.0	120.0	90
	0.14	2.89	209.6	192.0	92

TABLE III

	Groups of Controls and Patients			
	I	II	III	IV
Excretion of ascorbic acid in 24 hours before saturation. Mg.(mean)	29	19	7	7
Ascorbic acid (mg.) given before saturation produced ..	684 (500-1,000)	1,251 (700-2,300)	3,691 (2,100-5,000)	4,543 (2,000-8,000)
Reduced ascorbic acid in blood (mg. per 100 c.cm.): Means—				
Before saturation	1.28	0.80	0.42	0.34
After saturation ..	1.71	1.50	1.39	1.55
Oral tolerance test ..	Not deficient	Not deficient	Deficient	Deficient
Intravenous tolerance test	Not deficient	Not deficient	Deficient	Deficient
Intradermal test: mean decolorization times (minutes)	6.3		16.9	

Taking the control subjects of Groups I and II together we found the mean decolorization time to be 6.3 minutes (3 to 11 minutes), while the patients in Groups III and IV together gave a mean decolorization time of 16.9 minutes (3 to 29 minutes). However, after saturation (as shown by the methods described above) of these patients in Groups III and IV all the decolorization times were between 0.5 and 6 minutes.

Discussion

By employing the different methods for the determination of vitamin C we have been able to compare their results and to use them in estimating the degree of "saturation" of the body in respect to vitamin C in groups of normal subjects and of patients with peptic ulceration and with haematemesis. The measurement of the daily urinary excretion of ascorbic acid is said to be a fair index of deficiency, a value of about 13 mg. being taken as the average minimal excretion. Low excretion figures were in this way obtained by Harris and Ray (1935) in scorbutic infants; on the other hand, in Schultzer's (1936) series of scorbutic patients the excretions during each twenty-four hours of the control period before performing the "saturation" test were 13, 19, and 24 mg. respectively, although large quantities of ascorbic acid (9,500, 7,000, and 14,400 mg.) were required for "saturation." In our Groups III and IV it will be seen that all the patients gave figures below 13 mg., although the control groups gave higher values in all but six patients.

The "saturation" test has been employed quite frequently, and also appears to furnish a fair index of vitamin C saturation of the tissues; we consider it to be more accurate than the estimation of daily ascorbic acid excretion in the urine. The term "saturation" as introduced by van Eekelen *et al.* (1933) and Johnson and Zilva (1934) is a state of optimal ascorbic acid supply above which excess of ascorbic acid is excreted almost quantitatively (70 to 80 per cent.) in the urine within eight hours of ingestion. Nevertheless "unsaturation" is not an abnormal state and occurs in normal individuals, who, Johnson and Zilva (1934) have shown, may require 200-mg. doses of ascorbic acid for several days before an increase in the urinary output is noted. Unless the individual remains on a diet containing excess of vitamin C this state of "saturation" is not maintained, and the individual becomes rapidly "unsaturated," though normal. However, while agreeing with these workers on the fact

that normal unsaturated controls may require fairly large quantities of ascorbic acid for "saturation," we suggest that the comparative value of the results loses nothing in value, since, as will be seen from our results, there is such a big difference between the amounts of ascorbic acid required to "saturate" normal controls (Groups I and II) and test patients (Groups III and IV). While this may not be of absolute significance its comparative importance cannot be overlooked.

It must be remembered that before ascorbic acid can be excreted in the urine absorption must take place in the alimentary tract, and pathological changes therein—for example, inflammatory conditions—may well affect the absorption of the vitamin, while alterations in the alimentary chemistry and physics may also lead to destruction of ascorbic acid. The ulcer patients in Groups III and IV as a routine measure were given alkalis, and since ascorbic acid is destroyed rapidly in alkaline solutions there may be much less in the stomach and upper intestine before absorption (further work on this point is already in progress): the occurrence of an alkaline urine, part of which may be in the bladder overnight, leads to lower values for urinary ascorbic acid than are found with an acid one (Hawley *et al.*, 1936).

The determination of the ascorbic acid content of the plasma thus serves as a very useful guide, and it is probable that this will ultimately prove to be a more reliable diagnostic test in the detection of vitamin C deficiency. It must be borne in mind, however, that the normal resting plasma ascorbic acid (0.6 to 1.85 mg. per 100 c.cm.) is subject to sudden fluctuations after a temporary deficiency of the vitamin in the diet: in these circumstances a low plasma ascorbic acid may be obtained, but if the figure falls much below 0.45 mg. per 100 c.cm. dangerous depletion of the body stores of the vitamin is developing. The highest figure obtained in Groups III and IV—patients with peptic ulceration with and without haematemesis—was 0.59 mg. per 100 c.cm., and the lowest 0.14 mg. per 100 c.cm., the lowest values and the severest degree of deficiency tending to be found in the patients with haematemesis (Group IV).

The responses following oral test doses of ascorbic acid show considerable differences between the plasma ascorbic acid levels in the control subjects and those in the patients with peptic ulcer; in the latter they are almost negligible. Similarly the urinary concentration of ascorbic acid in the following four to six hours shows little or no increase in the ulcer patients, although good responses are obtained in the controls. In this test, however, both plasma and urinary changes are dependent upon the rate of absorption of ascorbic acid from the alimentary tract, and therefore the criticism applied to the saturation test may also apply to this one. The intravenous method of administering the ascorbic acid overcomes this objection; nevertheless the rapid increase of plasma ascorbic acid that occurs in fifteen to twenty minutes after intravenous administration of the test dose is still very different in the control groups (I and II) and in the patients with peptic ulceration, the responses in the latter being very much smaller.

Perhaps of rather more importance is the fact that in our normal controls 660 to 985 mg. of the test dose are excreted in the urine in the subsequent twenty-four hours, while only 72 to 458 mg. are excreted in the "ulcer" patients; further, the greater part (at least 83 per cent.) of the ascorbic acid excreted in twenty-four hours appears in the first five hours after injection and thus offers the possibility of greatly simplifying the test, so that it is only necessary to determine the first five hours' excretion following intravenous injection of 1,000 mg. ascorbic acid. Values below 400 mg.—that is, 80 per cent. of 500 mg., the minimal twenty-four hours' excretion—are regarded as subnormal. Thus in five hours an accurate estimation is obtained of the vitamin C content of the body. In this manner it is possible to avoid alteration of the vitamin in, or differences in the rate of absorption from, the alimentary tract, and it also avoids almost entirely the loss of ascorbic acid in the bladder in the presence of an alkaline urine overnight. The intradermal test is regarded as only a rough index of vitamin C deficiency; nevertheless for rapid clinical use where elaborate facilities are not available it may well prove useful.

It will be noted that all the methods used compared well with one another, and it has been shown that, taking the level of normal controls on good dietary intakes of vitamin C as a standard, there is a marked deficiency of vitamin C in patients with peptic ulceration and haematemesis.

In spite of the experimental evidence put forward from animal experiments it cannot be suggested that lack of vitamin C is an aetiological factor in production of peptic ulceration or haematemesis, although it may well be concerned in delayed healing or the chronicity of peptic ulcers. The diet should therefore be corrected by the addition of the vitamin so that the needs of the body as a whole be not overlooked. The diet used in the treatment of peptic ulceration, especially after haematemesis, will rapidly produce a vitamin C deficiency and a vicious circle thus be set up, leading to delayed healing of the ulcer.

It is interesting to note that the patients with haematemesis showed the greatest deficiency of the vitamin, since it has long been recognized that a sufficiently severe C avitaminosis is associated with increased capillary fragility—in fact, the original tests for vitamin C deficiency were based on this fact (Göthlin, 1931). It is clear, therefore, in view of our results and those of other workers, that the diet of these patients with gastric or duodenal ulceration and haematemesis should be amplified by the addition of vitamin C, while the parenteral administration of ascorbic acid in the first few days should be of considerable value in reaching a rapid saturation of the tissues.

Summary

1. The blood content and the urinary excretion of vitamin C (ascorbic acid) have been investigated by six methods in a series of 107 subjects (fifty-one control subjects, twenty-five patients with peptic ulceration, and thirty-one patients with haematemesis).

2. Using the urinary excretion method, groups of normal controls, miscellaneous ward controls, patients with peptic ulcers, and patients with haematemesis excreted mean amounts of 29, 17, 7, and 7 mg. respectively daily.

3. With the saturation test it was found that to produce a 50 per cent. excretion of the administered ascorbic acid the normal controls, patients with peptic ulceration, and patients with haematemesis required 500 to 2,300, 2,100 to 5,000, and 2,000 to 8,000 mg. respectively.

4. The initial plasma ascorbic acid value (normal 0.60 to 1.85 mg. per 100 c.cm., patients with peptic ulceration and haematemesis 0.14 to 0.59 mg. per 100 c.cm.) was an approximate measure of the vitamin C nutrition of the body tissues.

5. An oral ascorbic acid tolerance test has been described after oral administration of 1,000 mg. ascorbic acid; the maximal plasma ascorbic acid value was reached in one to two hours, while the maximal urinary excretion occurred in four to six hours; in normal controls there was a good response in both blood and urinary levels—in

the ulcer and haematemesis cases the response was negligible.

6. An intravenous ascorbic acid tolerance test following the intravenous administration of 1,000 mg. ascorbic acid has also been described; the maximal plasma ascorbic acid value was reached in fifteen to twenty minutes after the intravenous test dose, while the maximal urinary excretion occurred some two hours later. In normal cases 660 to 985 mg. of the ascorbic acid was excreted in twenty-four hours, of which 83 to 95 per cent. appeared in the first five hours; in patients with peptic ulceration and haematemesis 72 to 458 mg. of the ascorbic acid was excreted in twenty-four hours, although, as before, at least 80 per cent. appeared in the first five hours.

7. It has been suggested that this intravenous ascorbic acid tolerance test can be simplified for routine purposes by omitting the blood determinations and merely estimating the amount of ascorbic acid excreted in the urine in the five hours after the intravenous administration of 1,000 mg. ascorbic acid; this may not hold in cases with severe renal impairment.

8. The intradermal test for vitamin C deficiency was also carried out on these cases, and the results agreed very closely with those of the other tests, decolorization times longer than ten minutes indicating vitamin C deficiency.

9. Using the six methods for determining vitamin C nutrition, it has been shown that patients with peptic ulceration and with haematemesis suffered from severe vitamin C deficiency.

10. The severest degrees of vitamin C deficiency were found in the patients with haematemesis. It is suggested that large doses of vitamin C should be given to all subjects of peptic ulceration and haematemesis in order to saturate them as rapidly as possible.

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VITAMIN C DEFICIENCY IN PEPTIC ULCERATION ESTIMATED BY THE CAPILLARY RESISTANCE TEST

BY

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Recent research has shown that the diet usually prescribed in gastric disease, particularly in gastric and duodenal ulcer, is deficient in vitamin C. It is probable that it is also deficient in other vitamins, notably vitamin B_1. Harris and his collaborators (1935, 1936a, 1936b), in a series of investigations on the excretion of vitamin C in seventy-four hospital patients, have found that those patients with gastric or duodenal ulcer, or dyspepsia, who had been on special gastric ulcer diets had a very low vitamin C output in the urine. Harris mentions that in guinea-pigs vitamin C deficiency sometimes predisposes to gastric ulcer, and suggests that the placing of a peptic ulcer patient on a vitamin-C-free diet may result in the production of a vicious circle. Archer and Graham (1936) have produced evidence that six out of nine patients suffering from gastric and duodenal ulcer showed a considerable degree of vitamin C unsaturation.

Troutt (1932) points out that while the diets of Sippy, Lenhartz, von Leube, and Alvarez have been used with success for controlling the acute symptoms of peptic ulcer they make no provision for vitamin C. At first sight it might be thought that the giving of vitamin C in the form of orange juice would be prejudicial on account of its acidity, and it is found in fact that some patients have an instinctive aversion to it. However, Troutt states that about half a glass of orange juice (3 oz.) after a meal causes no discomfort in most patients with peptic ulcer. He points out that theoretically 40 litres of orange juice would be required to furnish the equivalent of the acid contained in 100 c.cm. of gastric juice of *p*H 1.7, and since the stomach normally secretes 3,000 c.cm. of gastric juice daily the consumption of four ounces of orange juice a day would have a negligible effect on the amount of acid present. It is of course well known that vitamin C is rapidly destroyed in the presence of strong alkalis such as sodium hydroxide, but it is very doubtful whether its stability would be significantly altered even by the considerable doses of any of the weak alkalis—for example, sodium bicarbonate, magnesium oxide, bismuth carbonate—administered to patients suffering from peptic ulcer.

The problem of the relation of vitamin C to capillary fragility is complicated by the discovery by Szent-Györgyi (Bentsáth, Rusznyák, and Szent-Györgyi, 1936) of a factor (vitamin P) occurring in close association with vitamin C which appears to have an effect on the condition of the capillary walls. For the purpose of this paper, however, no attempt will be made to differentiate between the effect of vitamin C and that of Szent-Györgyi's factor, and although the latter factor may ultimately prove to be the one responsible for the changes in capillary fragility it will be convenient to refer simply to antiscorbutic vitamins.

The present investigation was carried out with the object of ascertaining whether the deficiency of antiscorbutic vitamins in peptic ulcer described by Harris and other workers is sufficient to cause a lowering of the capillary resistance. It was also hoped that analysis of the patients' diet would shed some light on the problem as to whether

the vitamin deficiency in question preceded the development of peptic ulcer or was a result of the therapeutic regimen.

Method

The method adopted was similar to that described by Göthlin (1931) and used by him and his collaborators (Falk, Gedda, and Göthlin, 1932) in the investigation of a large number of normal and pathological subjects. The principle of the test is to compress the upper arm at standard pressure so as to increase the pressure within the capillaries, and then to count the number of ruptured capillaries after a given time as shown by the number of petechiae visible within a given area of skin. As a rule three subjects were tested simultaneously. A central compression chamber was used, to which were connected a metal compressor, a mercury manometer, and three rubber tubes leading to three standard blood-pressure tourniquets. It was found possible to make this system sufficiently airtight to dispense with the fine adjustment mechanism used by Göthlin. A circle of 60 mm. diameter was marked out in the angle of the elbow by means of a standard rubber stamp. The petechiae occurring within this area following the compression of the upper arm at a standard pressure (50 mm. Hg) were counted and the number recorded. The following information was obtained in respect of each patient: the disease and its duration, length of stay in hospital up to the time of the test, diet while in hospital, diet during the two months immediately preceding entry into the hospital, and diet before the appearance of any symptoms of the disease.

Results of the Investigation

Eighty-seven subjects in all were examined by Göthlin's method. Of these, twenty-eight were suffering from gastric ulcer, fourteen from duodenal ulcer, and twenty-three from various diseases other than peptic ulcer, while twenty-two were normal healthy persons living an ordinary life with free choice of diet and sufficient private means to purchase ample fruit and vegetables.

THE NORMALS

The following results were obtained from the normals:

8 gave no petechiae	2 gave 4 petechiae
4 „ 1 petechia	1 „ 6 „
5 „ 2 petechiae	1 „ 9 „
1 „ 3 „	

Total: 22 patients gave 40 petechiae.
Average number of petechiae, 1.82.

Göthlin gives 0 to 4 as the normal range of petechiae, 5 to 8 as indicating a transitional stage of vitamin C deficiency, and more than eight as showing a definite deficiency. There was no particular evidence of vitamin C deficiency in the diet of the two normals giving more than four petechiae, so we may class these as being in the nature of sporadic variations from the normal.

THE GASTRIC ULCER CASES

The twenty-eight patients suffering from gastric ulcer gave the following results:

1 gave no petechiae	3 gave 8 petechiae
1 „ 1 petechia	2 „ 9 „
1 „ 2 petechiae	1 „ 10 „
3 „ 3 „	2 „ 13 „
6 „ 5 „	1 „ 14 „
3 „ 6 „	1 „ 26 „
3 „ 7 „	

Total: 28 patients gave 199 petechiae.
Average number of petechiae, 7.10.

Statistical analysis shows that this mean is significantly different from that found above for normals.

From these results it may be seen that if we accept Göthlin's standards 53.6 per cent. of the patients were in a transitional stage of vitamin C deficiency and 25 per cent. were showing definite signs of deficiency. Actually the deficiency demonstrated by these results is greater than it appears, for some of the patients giving a small number of petechiae were receiving dietary supplements containing vitamin C, such as orange juice. This applies, for example, to the first two on the list, and if these are excluded the average number of petechiae then becomes 7.61 instead of 7.10.

The diet prescribed for patients in hospital was a modified Sippy diet, including the administration of alkalis. All of those patients who developed fewer than four petechiae had received supplementary sources of antiscorbutic vitamins, such as orange juice, in addition to the usual gastric ulcer diet. In the case of those patients developing four or more petechiae the only source of antiscorbutic vitamins was small quantities of potato, and the longer the patient's stay in hospital on this regimen the greater was the number of petechiae which developed. It therefore appears that the degree of fragility of the capillaries can be correlated with an inadequate intake of antiscorbutic vitamins. The records further show that, at least in some patients, the ulcer had developed in spite of an apparently ample supply of antiscorbutic vitamins in the diet before the patient came under treatment. There was therefore no definite evidence that lack of antiscorbutic vitamins was directly responsible for the occurrence of ulceration.

THE DUODENAL ULCER CASES

Fourteen cases of duodenal ulcer gave the following result:

2 gave 1 petechia	1 gave 8 petechiae
2 „ 2 petechiae	1 „ 11 „
2 „ 3 „	1 „ 14 „
2 „ 4 „	1 „ 15 „
1 „ 5 „	1 „ 30 „

Total: 14 patients gave 103 petechiae.
Average number of petechiae, 7.36.

This figure again differs significantly from that obtained for normals. Twenty-eight and a half per cent. gave more than eight petechiae, and were therefore, according to Göthlin's standard, suffering from definite vitamin C subnutrition.

Those patients who developed fewer than four petechiae had, with one exception (in which orange juice had been added to the diet), obtained their antiscorbutic vitamins almost entirely from potatoes. Of those patients who developed four or more petechiae none had received any important source of antiscorbutic vitamins in the diet for at least two weeks before the test. One possible exception to this was the patient who developed thirty petechiae, whose only source of antiscorbutic vitamins for some months had been boiled turnips. As in the case of gastric ulcer patients, therefore, the degree of capillary fragility could be correlated with the deficiency of antiscorbutic vitamins in the diet. Potatoes, however, seemed to be more effective in supplying enough antiscorbutic vitamins to prevent capillary fragility than in cases of gastric ulcer. There also appeared to be considerable variation in the time taken by various patients on a similar diet to develop capillary fragility.

VARIOUS DISEASES

Capillary resistance tests were carried out on twenty-three patients suffering from various diseases, which

included myxoedema, hyperthyroidism, diabetes, pyelonephritis and nephritis, cardiac failure, pernicious anaemia, lymphatic leukaemia, myelogenous leukaemia, cerebral tumour, pneumonia, bronchial asthma, chorea, polyarthritis, gastritis, chronic diarrhoea, and leucoplakia. Of these twenty-three patients seventeen were receiving daily doses of orange juice and the remaining six were consuming potatoes daily, with tomatoes and other vegetables and fruits, and occasional quantities of orange juice. These patients gave the following results:

6 gave no petechiae	2 gave 5 petechiae
5 „ 1 petechia	1 „ 7 „
3 „ 2 petechiae	1 „ 10 „
1 „ 3 „	1 „ 14 „
2 „ 4 „	1 „ 68 „

Total: 22 patients gave 63 petechiae. (The last patient was suffering from myelogenous leukaemia, and, since capillary fragility is well known in such cases irrespective of diet, his case was not used in computing totals or averages.) The average number of petechiae was 2.86. Statistical analysis showed that this was not significantly different from the normal average. 14 per cent. gave between four and eight petechiae, and 9 per cent. gave more than eight petechiae.

Discussion of Results

The question of the age of patients requires consideration, although Göthlin has produced evidence that even great age does not significantly affect the capillary resistance. It may, however, prove of interest to give the average age of the groups under consideration. The age averages were: gastric ulcer cases, 48.6 years; duodenal ulcer cases, 42.3 years; various diseases, 46.7 years. It was not possible to obtain the actual ages of all the normals investigated, but an estimated average is 22 to 25 years. It is apparent that the normal group is not completely comparable with the diseased group. Nevertheless the fact that the age averages of the other three groups are approximately the same provides a satisfactory check upon any possible influence of age. As regards sex, twelve out of twenty-eight gastric ulcer cases were female: only one out of fourteen duodenal ulcer patients was a female. Thirteen out of the "various diseases" group were female, and thirteen out of the twenty-two normals were female. With the exception of the duodenal ulcer cases, therefore, the distribution between the two sexes was fairly even.

It appears from the above that the lowering of the capillary resistance in cases of gastric ulcer is traceable directly to deficiency of antiscorbutic vitamins in the diet. The results were not of such a clear-cut nature in the duodenal ulcer cases, but nevertheless there appears little doubt that those cases which have been for more than ten days on the dietary regimen usually prescribed show a definite increase in capillary fragility, unless the diet has been supplemented with some potent source of antiscorbutic vitamins.

The genesis of peptic ulcer could not be correlated definitely with deficiency of antiscorbutic vitamins in the diet, but the possibility that it may play a part in some cases cannot be excluded. It seems more likely that the deficiency of antiscorbutic vitamins in the therapeutic diet may be a factor influencing the transition from the acute to the chronic condition, predisposing to delay in healing, relapses, and possibly haematemesis, but of this we have at present no definite proof.

It is of interest to note that many of these patients said that before the onset of their complaint they had no liking for fresh fruit, salads, or green vegetables, but all who expressed this dislike asserted that they were very fond of potatoes. This appears to be an interesting example of compensatory selection of diet.

Summary and Conclusions

1. Eighty-seven subjects have been examined by Göthlin's capillary fragility method. These subjects included patients with gastric and duodenal ulcer, cases of various diseases, and normal people of both sexes.

2. Hospital patients on a dietary regimen for gastric or duodenal ulcer showed a degree of capillary fragility significantly greater than normal subjects or patients suffering from other diseases.

3. Examination of the records of the patients indicates that the degree of capillary fragility is related to inadequacy of the diet in respect of antiscorbutic vitamins.

4. No evidence was obtained from the records that the development of peptic ulcer was conditioned by deficiency of antiscorbutic vitamins in the diet.

I wish to express my thanks to W. A. Carr Fraser, D.Sc., B.V.Sc., F.S.S.Lond., statistician to the Nutrition Council of the Commonwealth of Australia, for the statistical analysis of the data. I am also indebted to Professor Lambie for help and advice; and to the medical superintendents and resident medical officers of the Royal Prince Alfred Hospital, the Sydney Hospital, the Prince Henry Hospital, and the North Shore Hospital for their assistance in obtaining peptic ulcer patients.

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PROPHYLACTIC USE OF SULPHONAMIDE PREPARATIONS IN OBSTETRIC PRACTICE

BY

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At the end of 1936 my colleagues at the Royal Maternity and Simpson Memorial Hospital and I were approached by Bayer Products Ltd., the manufacturers of prontosil, and by Messrs. May and Baker, the manufacturers of proseptasine, with a request to try the effect of their products prophylactically. The amount of work to be overtaken by a limited resident staff in the hospital is so great that no investigation on strictly scientific lines and requiring much additional clerical work could be contemplated; but we agreed to make a rough-and-ready clinical experiment on a large scale by administering one or other of these drugs to every patient in the early days of her puerperium over the whole period of one year. The results of that year's work compared with those of previous years would afford reasonable ground for forming an opinion as to the efficacy or otherwise of the sulphonamide preparations in preventing the occurrence of puerperal infection.

The Routine

In order to obtain approximately equal numbers under each drug all women admitted on Monday, Wednesday, and Friday and each alternate Sunday were given prontosil after delivery; those admitted on the other days were

given proseptasine. The drugs, which were supplied by the makers free of charge for the purpose of this test, were prontosil album (*p*-aminophenylsulphonamide) in 5-grain tablets and proseptasine (*p*-benzylaminophenylsulphonamide) in 7½-grain tablets.

The routine was that each patient received two tablets three times a day for the first four days after delivery, and then one tablet three times a day until the end of the seventh day. The prontosil group therefore received in general a total of 165 grains of prontosil album in the course of seven days, while the proseptasine group received 247½ grains of proseptasine in the same period. One qualification must be mentioned—namely, that rather less than a half of the prontosil group received only one tablet three times a day for the whole seven days. This reduced dose was given to his patients on the request of one member of the staff, who had observed toxic symptoms elsewhere when the larger dose had been administered.

In all cases in which there was a clear probability of uterine infection a more intensified treatment was given, the soluble form of sulphonamide being injected intramuscularly in addition to the oral administration as above mentioned. Such cases included "failed forceps" outside hospital, acute pyrexia early in the puerperium, and cases of septic abortion. The drugs given intramuscularly were prontosil soluble in 2.5 per cent. solution, supplied in 10-c.cm. ampoules, and soluseptasine in 5 per cent. solution, supplied in 10-c.cm. ampoules. The routine of using drugs by injection was as follows: Prontosil soluble was given in an initial dose of 20 c.cm. followed by four doses of 10 c.cm. each at four-hourly intervals—a total of 60 c.cm. Soluseptasine was given in an initial dose of 10 c.cm. followed by three doses of 10 c.cm. each at four-hourly intervals—a total of 40 c.cm. In most potentially infected cases an injection course was begun within a few hours of delivery, and in one or two instances the first dose was actually given before delivery.

Toxic Effects

There were remarkably few cases in which any toxic effects of the drugs were observed. The most frequent and obvious toxic sign was cyanosis, which occurred in cases of the routine oral administration but proportionately more often where the oral administration was being supplemented by injections. The only other sign or symptom which we noticed at all frequently was a slight drowsiness. There were no cases of marked anaemia induced by the drugs or of acidosis. During the year numerous cases of diarrhoea with nausea or vomiting occurred. Although such symptoms have been reported as following sulphonamide administration it seems unlikely that any of these cases can be attributed to the use of the drugs, because a mild form of gastro-enteritis had been prevalent among the patients and staff in the hospital for two years or more. Mild albuminuria, another reported toxic sign, was not observed, and cases of toxaemia of pregnancy with occasionally massive albuminuria before delivery showed no abnormal persistence of albumin in the urine after delivery. There were no cases of skin eruption. Some cases with normal labour and spontaneous delivery manifested a persistently frequent pulse (90 to 110) during the puerperium without any other morbid signs. It was suggested that this might be the result of the drugs, but we had no clear evidence either for or against the suggestion.

Magnesium sulphate was not given by mouth at the same time as any sulphonamide preparation. If it became necessary to administer it the sulphonamide was stopped. Ferrous sulphate was frequently administered at the same time as the sulphonamide drugs and, as might be expected, gave rise to no appreciable abnormal symptoms.

Results of Year's Working

The results of last year's working may be summarized and compared with previous years thus:

I. Local Uterine Infection; that is, Cases with One or More of the Following Symptoms—Offensive Lochia, Uterine Tenderness, Delayed Involution, and no Other Recognizable Cause of Temperature if Pyrexia was Present.

1934	1935	1936*	1937
165 cases out of 1991 (8.2%)	193 cases out of 2,016 (9.5%)	150 cases out of 2,188 (6.7%)	139 cases out of 2,241 (6.2%)

* Throughout 1936 a similar experiment was carried out with calcium sulphide. Every patient received three grains of the drug thrice daily from the day of delivery until she left hospital.

II. Morbid Puerperia (B.M.A. Standard) due to Uterine Infection

1934	1935	1936	1937
77 (3.8%)	74 (3.6%)	67 (3.06%)	44 (1.9%)

During 1937 forty-seven patients in all were transferred to the City Fever Hospital as being frankly infected. Of these, two died (both of pneumonia after many weeks' illness). All but five of the forty-seven had been long enough in hospital to have received a more or less complete course of sulphonamide before transfer. In only five of the transferred cases was a positive culture of haemolytic streptococci obtained after removal to the City Hospital, but these were not the five who had been transferred too early to have received the routine sulphonamide treatment. In forty-nine cases out of the 139 local uterine infections high vaginal swabs were taken and sent to Dr. C. A. Green of the Bacteriological Department of Edinburgh University. Only three of these showed haemolytic streptococci, but none conformed to Lancefield's groups A—H. Of the remaining forty-six, twelve showed a culture of *Bacillus coli*, nine of staphylococcus, one of non-haemolytic streptococcus, and one of *Bacillus proteus*.

To investigate the relative efficacy of the two particular preparations of these drugs was no part of our purpose and would have involved more clerical work than we could reasonably demand of our resident staff. Our impression was that there was no appreciable difference between them either in efficacy or in toxicity, but in order to test this point briefly we analysed the first five hundred cases of 1937, with the following results, which on the whole seem to bear out the impression just stated:

Prontosil Group (240 cases)		Proseptasine Group (260 cases)	
Normal Labours—		Normal Labours—	
Spontaneous deliveries:		Spontaneous Deliveries:	
No infection	93.5%	No infection	92.3 %
Transferred to isolation ward	4.4%	Transferred to isolation ward	6.3 %
Uterine sepsis	1.2%	Uterine sepsis	1 %
Simple Uncomplicated Forceps Deliveries:		Simple Uncomplicated Forceps Deliveries:	
No infection	82.1%	No infection	88.8%
Transferred to isolation ward	17.9%	Transferred to isolation ward	5 %
		Uterine sepsis	5 %
Other Cases, including Abortion:		Other Cases, including Abortion:	
No infection	62.1%	No infection	59.6%
Transferred to isolation ward	29.. %	Transferred to isolation ward	31.5%
Uterine sepsis	8.6%	Uterine sepsis	7.1%

Since September, 1936, I have been using M. & B. 125, practically equivalent to proseptasine, at the Maternity Department of the Western General Hospital. Our intention there was to put every alternate case on prophylactic sulphonamide, but this routine has not been strictly adhered to, and there has been a tendency to select cases, the more serious ones and those more likely to be followed by infection being given the prophylactic doses. Two 7½-grain tablets were given four times a day for the first four days and one tablet three times a day for the next three days, so that the patients who were on this treatment received 307½ grains of sulphonamide in the week following delivery. No toxic symptoms of any significance or moment were observed, except in one case where a skin eruption occurred which was thought to be due to the sulphonamide medication.

Among 322 patients who received prophylactic sulphonamide there were twenty cases of morbid puerperia, but of these only six were due to local uterine infection, while one developed definite puerperal sepsis. Of 383 cases to which the sulphonamide was not given there were fifteen who showed signs of morbid puerperia, but of these again only six showed symptoms of local uterine infection, while one developed puerperal septicaemia. In this investigation, therefore, the general result seems negative.

My colleagues and I desire to express our thanks to Messrs. May and Baker and to Bayer Products Ltd. for their generosity in providing their drugs.

THE EARLY OCCURRENCE OF HIGH BLOOD PRESSURE IN COARCTATION OF THE AORTA

BY

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In recording high blood pressure as a regular feature of coarctation of the aorta Sir Thomas Lewis (1933) wrote: "We still lack records covering the periods of childhood and adolescence, during which seemingly very few cases are diagnosed. While it may be highly probable that coarctation means high pressure from a time shortly after birth to the time when cardiac failure supervenes, or death occurs from other cause, the gap that is still present in our evidence forbids us finally to draw the corresponding conclusion."

The youngest case then on record was a boy of 14 who had coarctation and a blood pressure of 150 mm. systolic (Hamilton and Abbott, 1927–8). Wilkinson (1932–3) published the case of a child of 4 years whose blood pressure was 150 mm. in the arms and who had only feeble pulsation in the iliac artery. In his case there was no evidence of anastomotic vessels. Sheldon (1932–3) published a case in the same year—that of a child of 12 in whom the blood pressure was 150 mm. in the arms and who had evidence of collateral circulation.

Case Report

The case here recorded was seen recently. The patient was a boy of 3 years. At birth artificial respiration was required, and during the first fortnight of life he became blue very easily and was treated for this with oxygen. Afterwards he was apparently normal and able to play with other children. His parents noticed that he became blue rather easily in the cold but not at other times. On examination he was found to be a small but well-nourished child without cyanosis. His heart was enlarged, the impulse being visible 2 cm. outside the nipple line in the fifth space, and the right border of cardiac dullness 1 cm. to the right of the mid-line. Dullness to percussion was found in the first and second spaces to the left of the sternum. A systolic thrill was felt to the right of the sternum in the second space and a harsh systolic murmur maximal at this point. A systolic murmur was heard over the inner ends of all the right intercostal spaces and in the same line below the costal margin, and in the neck. A similar murmur was heard along the left border of the sternum, but it was not so extensive. These murmurs probably resulted from enlarged internal mammary arteries. The heart sounds at the apex were normal. The radial pulses were full, but neither femoral pulse could be felt, nor was there any pulsation in the posterior tibial or dorsalis pedis arteries of either leg. Anastomotic vessels were then searched for and found. There was visible pulsation from anastomotic arteries running out of the subclavian triangle and under the anterior border of the trapezius, more prominent on the right than on the left; a thrill was felt over them on the right side. A tortuous artery was seen pulsating in the right axilla, and it could be traced from under the scapula and passing deep to the pectoral muscles. Pulsation was also found on the back, in the second, fourth, and fifth right spaces, and a systolic murmur was heard over all these areas. Radiographs failed to show any erosion of the ribs. When first seen in December, 1937, the blood pressure in the right arm was 150 mm. systolic and 85 mm. diastolic measured by auscultation, and 140 mm. measured by palpation. The pressure in the left arm was always about 40 mm. lower than that in the right arm. In January, 1938, when the patient was seen again, the pressure in the right arm was 162 mm. After resting for half an hour the pressure was 160 mm., and after another fifteen minutes' rest it was 158 mm. All these readings were taken with a sphygmomanometer by palpation.

Commentary

These cases help to fill the gap referred to earlier, and indicate that the blood pressure in coarctation of the aorta is high throughout life. The demonstration of high blood pressure in the child is important because it occurs at a period of life when high pressure from other cause is extremely rare. The conclusion, which may now be formed with more certainty, that high pressure is lifelong in coarctation is of value because these cases are useful in studying the effects of long-lasting high pressure of a relatively uncomplicated kind and in comparing the arteries in upper and lower limbs where they are submitted to very different pressures.

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The British *X*-Ray and Radium Protection Committee was formed in 1921, as the result of joint action between the Royal Society of Medicine, the Röntgen Society, the British Association for the Advancement of Radiology and Physiotherapy (now the British Institute of Radiology, incorporated with the Röntgen Society), the Institute of Physics, the London Radium Institute, and the National Physical Laboratory. The personnel of the committee was afterwards widened to include representatives from the provincial schools. Its first recommendations were issued in 1921, and these were revised in 1923, 1927, and 1934. A further revised report, dated January, 1938, has now appeared, and copies may be had from the honorary secretaries of the Protection Committee at 32, Welbeck Street, London, W.1, or the director, National Physical Laboratory, Teddington, Middlesex.

Clinical Memoranda

Dislocation of the Eyeball as a Complication of Oxycephaly

This case is presented because of the very unusual complication—namely, spontaneous dislocation of the eyeball.

CASE REPORT

Audrey R. was first seen at the General Infirmary at Leeds by Dr. Vining on July 12, 1935, when she was 8 months old. The mother was worried by the child's appearance and by the difficulty in breathing. Marked protrusion of the fore part of the head was noted, and the *x*-ray appearances were considered typical of oxycephaly. Exophthalmos was noted at that time. At 2 years of age she was seen again; she was then walking and was clean in her habits. In March, 1937, the notes read as follows: "Not so well. Very miserable. Can't get her breath. Mother thinks vision is defective. Increasing frequency of headaches."

On April 8, 1937, the mother returned from a short shopping expedition to find the child, in its perambulator, crying loudly. She brought her along to the Infirmary, and I then saw the infant for the first time. The appearances were as seen in Fig. 1. The left eyeball was completely dislocated forwards and quite immobile. The cornea was very dry, and it was impossible to see the fundus. The pupil was not dilated. An anaesthetic was given and the eye gently levered back into position with a spatula without any difficulty. In order to minimize the risk of recurrence a lateral tarsorrhaphy was performed. At the same time the right fundus was examined. Beyond slight pallor of the disk, scarcely sufficient to warrant the term optic atrophy, there was nothing of note. The next day the cornea was normal and the movements of the eye were as full as on the other side.

The child has been seen on several occasions since. There has been no deterioration of the general condition, and for the most part she appears to be quite happy. No recurrence of the dislocation has appeared. The vision seemed to be no worse than before, and the mother thinks that the left eye is still the better of the two (Fig. 2).

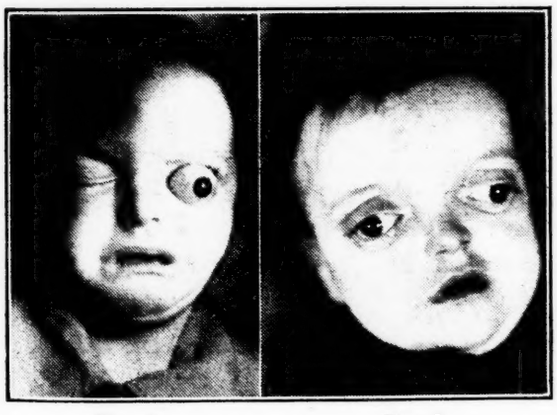

FIG. 1.
Before operation.

FIG. 2.
After operation.

CAUSE OF THE EXOPHTHALMOS IN OXYCEPHALY

There can be little doubt that the deformation of the orbit is the chief cause of the exophthalmos in oxycephaly and allied deformities. The basic pathology appears to be a premature synostosis of one or other group of sutures of the cranial vault, the deformity varying with the particular sutures involved. As a result the growing brain exerts pressure on the more yielding parts of the skull. The orbital plate of the frontal bone is depressed, and the greater wing of the sphenoid, forming the lateral wall of the orbit, is pushed forward. The capacity of the orbit is thus seriously reduced, and at the same time the axis of the orbit becomes much more obliquely directed down and out. This accounts for the divergence of the eyes so frequently noticed, and very marked in this case. The degree of exophthalmos in oxycephaly and allied deformities is proportionate to the reduction in orbital volume. In some patients it may be but slight, and in others productive of loss of the eye from lagophthalmic keratitis (Uhthoff).

What caused the dislocation in this case? The chief factors which normally keep the eye in position in the orbit are, no doubt: (*a*) the tension of the recti muscles. One knows how, during an enucleation, even a narrow band of undivided muscle will prevent the eyeball from coming forwards easily. (*b*) The degree of development and tenseness of the extensions of Tenon's capsule—that is, the check ligaments. (*c*) The action of the orbicularis muscle. Beyond a certain degree of proptosis, however, the plane of action of the orbicularis may be behind the equator of the globe; its action would then be reversed, and it might even exert sufficient pressure on the posterior half of the eyeball to dislocate it forward.

COMMENTARY

In an attempt to explain this case one may assume that the proptosis was so gross that the action of the orbicularis was largely nullified or reversed. In a fit of crying the spasm of the orbicularis was so great as to dislocate the globe from the orbit against the slight resistance of a very lax system of muscles and fascia. Once expelled, there would be but little tendency for spontaneous reduction of the eye into an orbit so much reduced in size.

I wish to express my thanks to Dr. Vining and to Mr. J. Foster for their kind permission to publish this case.

Leeds. J. SHERNE, F.R.C.S., D.O.M.S.

Cardiazol in Infancy

The treatment of schizophrenia by massive doses of cardiazol has aroused considerable interest recently. A report of a case in which this drug was given in its more usual sphere might be of interest.

CASE RECORD

The patient was a male child, 11 lb. in weight when born. During the puerperium, after an unsatisfactory attempt at breast feeding, the child was given a well-known brand of condensed milk. He suffered from intermittent diarrhoea and gradually lost weight. After three weeks the diarrhoea became so marked that the parents gave him 1½ grains of hydrarg. cum creta in divided doses. When first seen by one of us twenty-four hours later he was obviously dehydrated, though at the time circulation and respiration were not seriously affected. Fortunately he was not vomiting. Brandy and slightly sweetened water were ordered. Unfortunately the baby, refusing all fluids, rapidly became worse, and twelve hours later the eyes were sunken and glazed, with the eyelids half opened, respiration shallow and gasping, the heart sounds feeble and rapid, and no pulse could be felt at the wrist. Weakness was so marked that the child could barely swallow: he seemed to have no desire for fluid, which had to be introduced by means of a pipette. He retained very little when given a rectal saline. The case looked hopeless.

Two drops of cardiazol were introduced into the first feed by pipette of weak condensed milk, and as this seemed to give the child some desire for further fluid it was repeated four-hourly. After the first dose of cardiazol four minims of pituitrin were injected hypodermically and repeated once six hours later. As a result of this treatment the circulation improved, but the most interesting feature was the increase in appetite after every dose of cardiazol. After forty-eight hours the baby seemed out of danger, so cardiazol was discontinued. The next day he was not so well; his circulation was sluggish and he was again apathetic to his feeds. The administration of cardiazol was resumed and he took his feeds more readily. His general condition also improved. After several days the cardiazol given was gradually reduced, and after a week the baby made an uneventful recovery. The condensed milk feeds were replaced by ostermilk (full-cream), which he took readily. He is now 7 months old and weighs 22 lb.

We would be interested to hear of any similar case occurring in England. Excellent results in the treatment of malnutrition with collapse in infants have been reported in German literature by Koschate (1935) and Hoffmann (1937).

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Pneumococcal Meningitis treated with Prontosil

The following interesting case, in which pneumococcal meningitis was treated with prontosil, seems worthy of record.

CASE RECORD

A man aged 26 was admitted to hospital on December 27, 1937, complaining of photophobia, with some stiffness and pain in the head and neck. On examination definite neck rigidity and slight head retraction were found, and Kernig's sign was strongly positive. The temperature was 100° F. and the pulse rate 98. He gave no history of any recent lung, ear, nose, or throat affection, although he had had influenza about a month previously and had never felt well since. A lumbar puncture was performed on admission. The pressure was increased and the cerebrospinal fluid was opalescent. The pathological report on the cerebrospinal fluid was: total cells, 5,500; polymorphs, 98 per cent.; some Gram-positive cocci were seen on direct smear—in all probability pneumococci.

The patient was treated with large doses of prontosil, and three days later a second lumbar puncture was performed. The pressure was normal and the organism was again seen, proving on culture to be Type I pneumococcus. Administration of prontosil was continued. The patient's temperature remained raised for about five days; Kernig's sign gradually diminished, as did the headache and stiffness of the neck. On January 8, when a third lumbar puncture was performed, the cerebrospinal fluid was normal and the culture sterile.

This, as far as I know, is the second reported case of pneumococcal meningitis treated with prontosil. In the first one (*British Medical Journal*, 1937, **2**, 1204) it was doubtful if the successful issue was due to repeated lumbar puncture or to prontosil. In the present case, however, it is obvious that whatever the cause of the recovery it was not due to repeated lumbar punctures.

My thanks are due to Dr. A. M. Barron, senior physician to this hospital, for permission to publish this case.

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Reviews

PAEDIATRIC THERAPEUTICS

The Infant: A Handbook of Modern Treatment. By Eric Pritchard, M.A., M.D., F.R.C.P. (Pp. 744; coloured frontispiece; 47 figures, including 4 plates. 18s. net.) London: Edward Arnold and Co. 1938.

Written essentially for the general practitioner and based in part upon verbatim reports of postgraduate lectures extending over many years Dr. Eric Pritchard's handbook will be widely welcomed for its practical outlook. As its title suggests, treatment is the book's primary concern, pathology and aetiology only being mentioned in order to justify some form of treatment, diagnosis in order to enable the practitioner to be sure "that he is looking at the right paragraph," while prognosis is not considered. If this method of approach is accepted then the volume must be acclaimed successful. Early chapters deal with infant feeding, in which the author has always been particularly interested. His methods of using cow's milk will not be generally accepted, nor is it of value to mention the old "Grade A" milk now no longer recognized by the latest Order of 1936. In other sections there will also be found methods and views which are open to criticism. For example, few paediatricians would agree that "congenital pyloric stenosis" is entirely caused by spasm, likely to be successfully relaxed by drug treatment "in the great majority of cases." On the other hand, some original methods suggested will be certain of a wide acceptance. For example, the use of thyroid extract for premature babies and of tannic acid for sore buttocks appear to be well worthy of a trial.

It is impossible to do more than select a few examples for criticism or praise, for there are over seven hundred pages in this book, and few of them can be read without benefit by the specialist or the general practitioner. We hope that this permanent record of a lifetime devoted to the care of sick infants will be widely read.

MORPHOLOGY AND COMPARATIVE ANATOMY

The Development of the Vertebrate Skull. By G. R. de Beer, M.A., D.Sc., F.L.S., F.Z.S. (Pp. 515; 143 plates. 30s. net.) Oxford: Clarendon Press; London: Humphrey Milford, Oxford University Press. 1937.

Comparative Anatomy. By Herbert V. Neal and Herbert W. Rand. (Pp. 739; 540 figures. 21s. net.) London: H. K. Lewis and Co., Ltd. 1936.

The Development of the Vertebrate Skull, by G. R. de Beer, is a great work, dedicated to the memory of four pioneer workers on the morphology of the skull—namely, Thomas Huxley, Kitchen Parker, Ernst Gaupp, and van Wijhe. It will be of world-wide interest to morphologists, human anatomists, and embryologists, since it embraces the developmental history and comparative anatomy of the skull throughout the whole range of the vertebrate kingdom. It deals in a systematic and uniform manner with the structure and phylogeny of the vertebrate skull and contains a mine of information, presented in a uniform manner with respect to nomenclature and classification, which will prove to be of immense value to workers in this field for many years to come. This is a consideration which the author has anticipated and provided for by suggesting certain special and general problems which require investigation. Of special value to workers who are embarking on some particular piece of research will be the

introductory and earlier chapters dealing with general matters, such as the relation between cartilage and bone, the segmental composition of the skull, the determination of the hind limit of the skull in various types of vertebrates, the craniogenic materials of the neurocranium and visceral arch skeleton, and the processes of chondrification and ossification. The systematic section of the book is a monumental record dealing with the development and general morphology of the various types of vertebrate skulls and including detailed descriptions with illustrations showing the relations to the skull of the principal arteries, veins, and nerves. This section will be of the utmost value to the beginner and the experienced morphologist alike, since the various parts of the skull in different groups of animals are compared side by side in a systematic manner, which is easily grasped, and a great aid to the drawing of general conclusions from concrete examples of skeletal structure. The book has bearings which extend far beyond the limits of the skull, and, although the palaeontological aspect of the origin of the skull has not been included within its scope, it will be of great value to palaeontologists to have before them a full and reliable record of the various structural components of the skulls of animals living at the present day. Indeed, a work specially devoted to the skulls of prehistoric and fossil animals, conceived and carried out on similar lines and gathering together the numerous separate contributions to our knowledge of the early stages in the phylogeny of vertebrate and invertebrate skulls, would be a fitting sequel to the present work. Besides dealing with the morphology of the skull the author has included a short description of the experimental work carried out by Fell, Robison, and others on phosphatase activity in relation to ossification, and the effects of the secretions of endocrine glands on cartilage formation. He has also made brief reference to such problems as the dependence of the growth of the skull on the growth of the brain, which should be of special interest to members of the medical profession. This book should be procured for every biological library and translated into all the principal languages employed by scientific workers.

The frontispiece—namely, "The Creation of Man" by Michelangelo—which has been chosen by Professors Neal and Rand for their work on *Comparative Anatomy* is a fitting introduction to a treatise which deals with the gradual evolution of man and the higher types of living animals from lower organisms. Only one-half of the original fresco in the Sistine Chapel has been reproduced, but the existence and power of the Creator, who is represented as a complete figure in the original painting, is indicated by the hand with outstretched finger to the right of the picture. The book is written with the object of providing the student of human nature with a concise account of the genetic relations which exist between the different classes and types of animal forms which have preceded the evolution of man and the higher types of vertebrates. It is a book which can be read by anyone interested in the subject—for example, clergyman, anthropologist, geneticist, geologist—without involving a prolonged study of technical details, which are apt to obscure the primary object of the reader—namely, to get a working basis of established facts on which to build his general conceptions of the origin and nature of man: the reproductive system, the influences of heredity and environment, and the interaction of different parts of the body—for example, that of the endocrine organs. The study of any one of these extensive subjects involves some knowledge of the others, and the present work is an endeavour to supply that knowledge in a way which can easily be assimilated by a reader who has not had a long training in practical zoology and the kindred subjects of embryology and comparative anatomy. After a brief introductory explanation of the main features of the different classes of the animal kingdom, and a fuller general account of reproduction, the authors deal with the various systems as exemplified in lower and higher types of animals. The description of the genesis and comparative anatomy of the nervous system and sense organs is specially worthy of mention, and the concluding sections on the "head problem" and ancestry of vertebrates are also valuable commentaries on the historical and recent views upon these important subjects. The book is clearly written and well illustrated.

CLINICAL DIAGNOSIS

Physical Diagnosis: The Art and Technique of History Taking and Physical Examination of the Patient in Health and Disease. By Don C. Sutton, M.S., M.D. (Pp. 495; 298 figures, 8 coloured plates. 21s. net.) London: Henry Kimpton. 1937.

In well-equipped hospitals the information provided by laboratory tests and radiological examination tends in some degree to short-circuit the more laborious and systematic methods of the old clinicians and of those practising in isolated districts. As a result medical students may not be attracted to works on physical signs and rely on the ordinary textbooks of medicine. Dr. Don Sutton, with much experience of the needs of students, has followed a more attractive course in this comprehensive volume, which not only combines the old physical signs with the new methods of radiology but is practically an atlas of clinical diagnosis. This concise text is thus admirably supplemented by successful illustrations, a good example of which is the coloured plate of bismuthia, showing the facial appearance due to prolonged ingestion of bismuth, which resembles that of the rare condition argyria. The radiographs are well reproduced, and there are useful pairs showing the naked-eye and radiological appearances of the same condition. Stress is rightly laid on the importance of taking an accurate clinical history. Without overdoing it, the portraits of medical pioneers and photographs of the title-pages of their works give an interesting historical touch.

ORTHOPAEDIC PRACTICE

A Practice of Orthopaedic Surgery. By T. P. McMurray, M.B., F.R.C.S.Ed. (Pp. 471; 178 figures. 21s. net.) London: Edward Arnold and Co. 1937.

Before David went out to do battle with Goliath Saul arrayed him in his own heavy armour. But his own youthful agility, his sling, and the five smooth stones were of more use to him than the cumbersome equipment of the older man. To-day the Davids in our medical schools are being burdened more and more with weighty instruction in this and that special branch of medicine, until now even the benevolent Sauls that would send them forth are beginning to realize that something must be done to make the equipment lighter and allow for greater mobility. The teachers in the special departments, particularly, are required to confine their teaching to essentials, and this applies to the written as much as to the spoken word. Orthopaedics is a comparatively young subject, but most students are appalled by the size of the textbooks dealing with this important branch of surgery. No book has hitherto been produced which the average student has time to read or the capacity to digest. For this reason

the completion of Mr. McMurray's work has been awaited with more than usual interest, because of his eminence as a teacher of orthopaedic surgery. He has covered the ground in 460 pages, which means that the volume is within the scope of the senior student. Noticeable attention is given to principles, though perhaps less than one would have expected from a spiritual descendant of Hugh Owen Thomas. We had hoped to find a departure from the traditional approach (tuberculosis of joints, infantile paralysis, congenital deformities, etc.), and greater emphasis on restoration of function rather than on specific diseases. Such a book might suffer from being too long, for the author must still describe the diseases and deformities that impair function; yet descriptions of operations, not detailed enough for the orthopaedic surgeon and of little use to the student, could be omitted. For example, in the chapter on infantile paralysis no clear distinction is drawn between operations for correcting deformities the result of faulty treatment and the reconstructive procedures for the relief of inevitable deformity (which generally means residual paralysis) due to the severity of the original disease. The first can be avoided by good treatment, but not the second. We are told that "no definite rules as to procedure can be given, and each case must be dealt with according to the condition found." But surely there must be at least a few guiding principles in planning an attack on a paralysed limb—such, for example, as dealing with the hand before considering stabilization of the shoulder in a case where the upper extremity is seriously involved; and avoiding elongation of the Achilles tendon where a moderate equinus position of the foot is helping to stabilize a knee lacking an active quadriceps.

It is good to find that Mr. McMurray is an unashamed conservative, and he has defined the grounds for his conservatism in words that deserve repetition:

> "Orthopaedic surgery, which possibly may best be described as the surgery of the framework of the body, has developed from the surgery of the deformities of children and the so-called bone-setting of the unqualified practitioner. This branch of medicine is concerned chiefly with errors in the motor system—the result of disease or injury—and in his outlook the orthopaedic surgeon must consider the future rather than the immediate condition of the affected tissues. . . . As orthopaedic surgery is concerned largely with growing and developing tissues the outlook of the surgeon should be essentially conservative. Operations such as moulding and manipulation are usually preferable to the more radical measures which are naturally more attractive, especially to the younger surgeon, and this tendency to conservatism should not be discarded even though the simple procedures are sometimes followed by a recurrence of deformity. Extensive bone operations, which must interfere with growth, should be avoided as far as possible, and if such measures are necessary they should always be postponed until this danger has disappeared."

Mr. McMurray has other reasons for conservatism. Many elaborate operations on bones and joints are sound in conception and pretty to watch. They have one drawback—they give the desired result in only a minority of cases. These operations are sometimes accorded a place of honour in textbooks, but the impression given of their merits is too often misleading. This sentence is typical of the author's attitude: "The results of this procedure are very rarely satisfactory, and do not as a rule justify the surgeon's enthusiasm." One can rarely quarrel with his judgment. No informed surgeon will agree with all of Mr. McMurray's views, for he is dealing with a young branch of surgery in which controversy is still lively; but no one will deny that his teaching is fundamentally sane and safe. This book can be recommended with unreserved enthusiasm to the student, both before and after qualification; and it may be read with profit by practising surgeons who are humble enough to admit that they sometimes lose the guiding light of principle in the fog of the daily detail of clinical practice.

PSEUDOCYESIS

Pseudocyesis. By George Davis Bivin, Ph.D., and M. Pauline Klinger, M.A. (Pp. 265; 18 tables; 5 plates. 17s. 6d. net.) Bloomington, Indiana: The Principia Press, Inc.; London: Williams and Norgate, Ltd. 1937.

Some years ago Dr. George D. Bivin of Illinois began a systematic collection of all the published works on pseudocyesis, with a view to applying the knowledge so gained to the elucidation of certain psychological disorders. He was unable to finish the work, but it has since been completed by M. Pauline Klinger, and the result of their combined efforts is embodied in the first monograph on the subject. It records statistically all the 444 case-histories published to date, and classifies *in extenso* their relevant details under a variety of headings. The result is an exhaustive account of the aetiology, diagnosis, and treatment of a most difficult disorder, for though comparatively rare pseudocyesis always presents a problem at once distressing and disconcerting. For this reason alone any addition to our knowledge concerning it is of real value, and though the present work emphasizes the extreme variety of the symptomatology it also demonstrates the importance of very careful examination if the deplorable mistakes which have apparently so often been made in the past are to be avoided. The book is well indexed and contains a complete bibliography, and is in general a most valuable addition to the literature of an important and obscure subject.

Notes on Books

The thirty-ninth edition of *First Aid to the Injured*, the authorized textbook of the St. John Ambulance Association (price 2s.), differs from its predecessors in the special attention given to burns and the method of transporting a patient with spinal injury. It is considered that the treatment of extensive burns and scalds by tannic acid is a matter of skilled technique and outside the scope of first aid: the application of a warm solution of baking soda is advised. With regard to the treatment of spinal injuries, although no uniformity among the various authorities was found on inquiry, it has been decided to modify the methods to be observed by first-aiders in transporting these cases. Chapters on shock and its treatment and on the routine examination of a patient have been added, and there are many new illustrations. It is mentioned that the membership of the Brigade at home and abroad now exceeds 100,000. The Brigade also provides fully trained persons for the Royal Naval Auxiliary Sick Berth Reserve, the Military Hospitals Reserve, and Voluntary Aid Detachments.

We have received a *Short History of the Croatian Medical Society* (Zagreb, no price given), of which the Croatian text is followed by German, French, and English translations. The society was founded in 1874 by Dr. Franjo Milicic, the district medical officer of Zagreb, and soon gained a high reputation, holding regular meetings at which scientific and social questions were discussed.

Nursing Homes (1938) is now in its eighth year of publication as a directory of registered nursing, convalescent, and mental homes in England, Wales, and Scotland (Benn Brothers Ltd., 3s. 6d.). The information is arranged

geographically, and reference is thus facilitated. It is mentioned that many changes take place each year, and every effort has been made to ensure accuracy. Telephone numbers are given, and there is also a statement of the services which each institution is prepared to render; in some cases nurses are available for outside work.

Preparations and Appliances

RAPID RADIOGRAPHY FOR THE SMITH-PETERSEN OPERATION

Mr. ROBERT G. W. OLLERENSHAW (Manchester) writes:

It is probably safe to say that at the present time 95 per cent. of fractures of the neck of the femur are being treated by one or other modification of the Smith-Petersen nailing operation. This entails scrupulously careful checking of the position of the guide-wire. It is essential to take at least two films, and it may be necessary to take several more before the ideal position of the guide-wire is achieved. In most hospitals the films, taken by a portable outfit in the theatre, are carried some distance for processing, and in many cases, even when one of the modern high-speed developers is used,

FIG. 1.—Portable dark-room.

an interval of at least fifteen minutes may elapse before the wet films are returned to the operating theatre. If this period of waiting has to be repeated two or three times it involves a long and tiresome delay both for the staff and for the patient. By using the method here described it has been found possible to produce an entirely adequate film in one minute. An ordinary portable developing box is a great time-saver, but if it is to contain three dishes each large enough for a film twelve inches by ten inches, for developer, water, and fixative, it is bound to be unwieldy, and, moreover, it is only too easy to get the film into the wrong dish when working by touch alone. It occurred to us that, since the only requirements are a bony outline and the shadow of the wire, no fine detail being needed, some modification of the old "while-you-wait" process would solve all the problems, since it involves only one dish and can be made to work extremely fast. On these lines, therefore, we have evolved the developer formula given below. The ammonia of the old method had to be eliminated, since it was strong enough to make the atmosphere of the theatre unpleasant, and other modifications were involved to suit the *x*-ray emulsion. At normal theatre temperature development and fixation are complete in one minute. The film only requires washing to be reasonably permanent, but in practice this point is unimportant, since it is rarely necessary to preserve these intermediate films. Having reduced the process to this degree of simplicity, the production of a portable dark-room is easy. Our pattern consists of a box, 18 inches by 18 inches by 24 inches, fitted with light-tight drop-on lid, and with two 8-inch armholes in the front. To these holes are fitted sleeves of green felt (an opaque type is essential) 16 inches long, with elastic round the cuff. The sleeves are clamped to the box by plywood rings, ensuring a light-tight joint. Internally, the box has a 10-inch shelf extending from the back and resting loose on battens half-way up the sides of the box. Running fore and aft across the middle of the floor is a strip

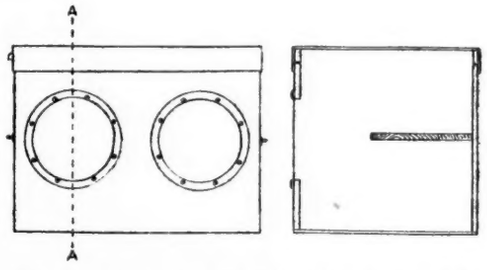

FIG. 2.—Front elevation and section through AA.

of wood 1/8 inch thick, across which the dish is balanced, and which then acts as a rocker-bar. Any competent joiner can build the outfit for twenty to thirty shillings. It should be blacked internally, and fitted with handles as shown in Fig. 1.

In use the cassette is placed on the shelf, open side to the front, and the lid closed. The operator's hands are placed in the sleeves, and these are invaginated into the box. He opens the cassette, slides the film round the edge of the shelf into the dish, and rocks it with a finger at each end. The rocker-bar not only makes this easy but, by limiting the excursion of the dish, makes the outfit almost non-spiliable. After removal of the finished film the loose shelf allows the dish to be removed and emptied. Owing to the fact that fixation is proceeding at the same time as development, and is therefore tending to reduce density, we find it best to double the normal exposure time for the tube in use. The developer does not keep too well when mixed, and for that reason we keep it as three components, given below. Mixing for use only takes a few seconds. Our experiments have been made with the Ilford improved fast film, double-coated.

Formulae

A. Sodium sulphite (anhydrous) .. .. .. (or crystalline, 200 grammes)	100 grammes
Sodium carbonate (anhydrous) .. .. .. (or crystalline, 160 grammes)	60 grammes
Sodium hydroxide (stick)	50 grammes
Water to	1,000 ml.
B. Sodium thiosulphate (crystalline)	375 grammes
Water to	1,000 ml.
C. Hydroquinone	30 grammes

(Conveniently kept weighed out and wrapped as powders. Store in an airtight tin.)

For use, dissolve the hydroquinone in 200 ml. of hot water, and add 400 ml. each of A and B: mix well. This keeps for about two days when mixed. Any fine precipitate of sulphur may be disregarded.

While the fundamental ideas are nearly as old as photography itself, we feel that this application of them to modern needs should be of some value. A Smith-Petersen pin was introduced satisfactorily at Salford Royal Hospital about two weeks ago, using the technique described above and with the Hey Groves direction finder, in twenty-three minutes.

JOINT TUBERCULOSIS COUNCIL

The meeting of the Joint Tuberculosis Council on February 19 was specially noteworthy since it marked the end of Dr. Ernest Ward's long period of secretaryship. Not only was Dr. Ward the originator of the council, but he has served as its secretary during the fourteen years of its existence. The chairman of the council (Dr. S. Vere Pearson) and Dr. G. Lissant Cox, the previous chairman, paid special tribute to the excellent service Dr. Ward has given. He is succeeded by Dr. J. B. McDougall (Preston Hall, near Maidstone, Kent).

The council decided to proceed with the publication of the exhaustive report on sputum examination prepared by the committee of which Dr. W. H. Tytler (Cardiff) is the convener. This report covers the whole field of sputum examination in an exemplary manner, and is likely to be in much demand. The secretary reported that the Ministry of Health had replied to a communication regarding the classification of patients who showed tubercle bacilli in discharges from glands, bones, and joints. The reply was to the effect that "Tb. plus" or "Tb. minus" relates only to patients suffering from pulmonary tuberculosis, and that patients showing tubercle bacilli in discharges from bones, joints, glands, etc., are not to be classified as "Tb. plus." There has apparently in the past been much ambiguity on this point, and the council expressed the view that the Ministry of Health should give publicity to this important decision.

Dr. Ernest Ward (Devon) presented his biennial report. This is valuable in so far as it gives a collective summary of the work accomplished by the council during the past two years, and there is an imposing account of the work of various committees. Special consideration is given in Dr. Ward's report to the microscopical examination of sputum, the culture of tubercle bacilli, examination of contacts, the results of artificial pneumothorax treatment, tuberculosis amongst nurses, milk, tuberculin, and sedimentation.

Memorandum on Nursing Services

The council gave lengthy consideration to the evidence to be submitted to the Interdepartmental Committee on Nursing Services. The memorandum on this subject was presented by Dr. G. Lissant Cox (chairman of the committee) and Dr. Esther Carling (secretary). The memorandum is a full and comprehensive account of the nursing problem in relation to tuberculosis institutions in this country; though certain difficulties had to be overcome by the committee a large measure of agreement was reached, and the evidence as a whole was accepted by the council. Matters concerning the inauguration of a supplementary register, the hours of duty of nurses, the definition of "assistant nurses," and the factors influencing the recruitment of nurses for tuberculosis institutions are all discussed in detail. Special consideration is also given to the training of nurses and to the employment of tuberculous ex-patients as nurses—a matter previously dealt with by the council in its Employment Committee's reports. Important suggestions for improved remuneration and conditions of service for nurses in sanatoria and hospitals for tuberculosis are given, and in the appendices to the memorandum there are examples of the treatment and nursing work done in modern sanatoria, time-tables for staff nurses and night nurses, and minimum scales of salaries proposed.

Dr. G. Jessel, the convener of the Radiological Interpretation Committee, was able to report that he had been successful in co-opting on his committee representatives of the radiological societies in this country, and that a comprehensive report would be available in due course. The work of the Joint Tuberculosis Council in organizing postgraduate courses for tuberculosis officers and others is now well known, largely through the efforts of Dr. W. Brand (Camberwell). Suggestions for further courses at home and abroad are under consideration.

L.C.C. CONSULTANT AND SPECIALIST SERVICES

It is proposed by the London County Council to continue for a further year, with certain modifications, the existing consultant and specialist services. The number of routine sessions to be worked by consultants and specialists at grouped general hospitals and other establishments has been limited to a total not exceeding 205 a week.

Anaesthetists' Sessions

The proposals now made will add about another fifty sessions. The greater number of these will be regular anaesthetists' sessions. The use made of the services of consultant anaesthetists varies considerably at different hospitals. It is considered that it would be a decided advantage for the medical staff at hospitals to be augmented by the regular services of consultant anaesthetists, and it is proposed that such consultants should be allocated to general hospitals for a fixed number of sessions a week, each approximately of two and a half hours' duration. Anaesthetists employed for regular weekly sessions will be paid at the usual scale for consultants and specialists—namely, £125 a year for one session a week and £75 a year for each additional weekly session, with additional payment of two and a half guineas a visit for each emergency attendance in addition.

Orthopaedics: Radiology: Obstetrics

Six additional sessions are required in connexion with orthopaedic surgery in order that each of the general hospitals which treat fracture cases may be visited weekly by a consulting orthopaedist. Certain rearrangements are to be made with regard to the service of full-time radiologists, and in addition to the two full-time radiologists at present employed a third is to be appointed for duty at five hospitals. This will mean that eleven sessions hitherto given by part-time consulting radiologists will no longer be required.

The arrangement whereby the consultant services in obstetrics and gynaecology at Fulham and St. Mary Abbots Hospitals have been undertaken during the last three years by the professor of midwifery at the British Postgraduate Medical School is considered no longer necessary, and the work is to be done by an officer of the Council—that is, a part-time obstetrician and gynaecologist. Four such officers are already employed in the hospitals service, and the arrangement whereby they have assumed responsibility for the obstetric and gynaecological work has proved very satisfactory. The rate of remuneration attaching to the new position will be £800 a year.

Neuro-surgery and other Specialties

The services of neuro-surgeons are being increasingly required, and it is proposed to create a panel similar to the existing panel of consulting neurologists. In practice the fees for neuro-surgeons when required in special cases have been fixed at two and a half guineas a visit for consultation and five guineas a visit when an operation is performed, irrespective of the number of patients seen or operations performed. Having regard to the highly specialized nature of the work, these rates of remuneration are considered reasonable for the new positions.

Other arrangements are that the number of sessions to be worked by thoracic surgeons at tuberculosis hospitals and at general hospitals (other than St. Mary Abbots, where special provision is made) is to be fixed at not exceeding 230 a year and 170 a year respectively, that the number of sessions to be worked by ear, nose, and throat surgeons at the medical tuberculosis hospitals shall be fixed at not exceeding 140 a year, and that one of the consultants for cardiovascular disease at Lambeth Hospital shall be employed for three sessions a week at a salary of £275 a year, which is the standard rate for "group" scheme consultants.

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THE FUNCTION OF VITAMIN C

The availability of vitamin C in the pure form as ascorbic acid has stimulated many workers to try to determine its function in the human organism. Almost the first problem that was tackled was the question of how much vitamin C was needed by man. At first the appearance of ascorbic acid in the urine was taken as an indication that the tissues of the body were saturated, but later it was shown that some ascorbic acid was excreted before this happened. The saturation of the tissues could be judged only by a determination of the total intake and output of ascorbic acid. Portnoy and Wilkinson have reported in a recent issue of this *Journal* (February 12, 1938) the results of their application to human patients of Rotter's skin test for the content of vitamin C. It is based on the time taken to decolorize 2:6-dichlorphenolindophenol when injected intradermally. From a comparison of their figures with the corresponding figures obtained by Abbasy's saturation test and those for the vitamin C content of the blood they conclude that if five minutes or less are required to decolorize the specified amount of dye saturation of the tissues with vitamin C may be assumed, but if the time required is longer than ten minutes a deficiency must be assumed. They consider the method of value as a rapid clinical test for vitamin C deficiency. The values corresponded roughly with what might have been expected from the diets of the different patients (that is, as containing much vitamin C, a moderate amount, or almost none). They do not draw any conclusion as to the amount of ascorbic acid required by man per day. Wackholder and Hamel,[1] however, have come to the conclusion that a daily dose of 250 mg. must be given in order to get an appreciable increase in the tissues; they postulate a specific dynamic action for ascorbic acid, as for proteins. Göthlin and his co-workers,[2 3] after modifying certain details of the capillary resistance test and investigating the limits of its usefulness, came to the conclusion that the absolutely indispensable daily requirement of a healthy adult is from 0.39 to 0.48 mg. per kilogramme of body weight. It is obviously desirable to allow more than this in planning a dietary, and it is obviously imperative that the amount given in curative treatment should be much greater. Giroud and his colleagues[4] determined the ascorbic acid content of the suprarenals, liver, and kidneys immediately after the (violent) death of twenty-six normal persons. They found the content of the kidneys less than that of the liver, and that of the liver less than that of the suprarenals. The content of organs of the older people was less than that of corresponding organs of the middle-aged, and those of the latter were less than those of the children. All the determinations were lower than were found in the same organs of well-fed guinea-pigs: they concluded, therefore, that man in general does not have enough vitamin C and that his diet must be regarded as inadequate in this respect.

As for the functions of vitamin C in the animal body, it has been shown[5] that formol toxoid becomes weakened in its antigenic property and that the virulence of tetanus toxin is slightly weakened through contact with moderate doses of ascorbic acid, although, strangely enough, higher and lower concentrations of ascorbic acid were without effect on either the toxoid or the tetanus toxin. According to Kligler and others[6] ascorbic acid inactivates diphtheria toxin under both aerobic and anaerobic conditions at a rate depending on the concentration of the vitamin and the temperature of incubation, though the action on preformed toxin is slower than it is on the toxin during production. The action may be one of oxidation and reduction, but glutathione did not produce the same effect. The suprarenals of guinea-pigs treated with diphtheria toxin showed a loss in vitamin C content. These workers suggest that the modified non-toxic type of infection so common in Palestine and other subtropical and tropical regions is ascribable to a higher vitamin C reserve or intake of the inhabitants of these regions, and they are at present making an investigation of this point. They also call attention to the post-diphtheritic appearance of scurvy in some children. The value of the "sekale preparation" in preventing post-partum bleeding has been exceeded by the value of ascorbic acid.[7] In surgical infections, both acute and chronic, increased intake of vitamin C has proved beneficial, and Lauber, Bersin, and Nafziger[8] have shown that in animals whose vitamin C metabolism was controlled there was unexceptionally an increased need for this vitamin after experimentally induced streptococcal infections. The same observers[9] have demonstrated that, in rabbits, during the narcosis produced by

[1] *Klin. Wschr.*, 1937, **16**, 1740.
[2] Göthlin (1937). *Acta Paediatr.*, Stockh., **20**, 1.
[3] Göthlin, Frisell, and Rundquist (1937). *Acta med. scand.*, **92**, 1.
[4] *Presse méd.*, 1937, **45**, 1774.
[5] *Klin. Wschr.*, 1937, **16**, 1460, 1463.
[6] *J. Path. Bact.*, 1937, **45**, 415.
[7] *Dtsch. med. Wschr.*, 1937, **63**, 1625.
[8] *Klin. Wschr.*, 1937, **16**, 1274.
[9] Ibid., 1272.

local anaesthetics, by chloroform, ethyl chloride, etc., there is an increased output of ascorbic acid in the urine. Intravenous injections of "redoxon" (Merck's ascorbic acid) compensated for the loss. Lauber and his colleagues[10] have also demonstrated that there is no increase in the output of ascorbic acid in the urine after simple fractures of the foreleg of the rabbit, but that there is after a compound fracture. Moreover, callus formation is not accelerated by giving ascorbic acid in doses greater than are needed to correct the hypovitaminosis. Another result, recorded by Fischer and Oehme,[11] which may prove important is that the administration of large doses of vitamin C reduced the output of creatine in the urine of rats suffering from thyroxine creatinuria.

Work previously published on the influence of vitamin C in controlling the development of poliomyelitis in monkeys which had been experimentally infected has been confirmed, with better results apparently from a product extracted from natural sources than from a synthetic product. The former contained 2.5 per cent. of unidentified impurities absent in the synthetic product. The concentrations of ascorbic acid in the tissues of normal monkeys (rhesus) were found to be comparable to those in the tissues of other animals that cannot synthesize vitamin C. They can be increased by prolonged parenteral administration of ascorbic acid. In monkeys suffering from poliomyelitis these figures are slightly below the normal average during the height of paralysis or in early convalescence. When inoculated monkeys were found to have resisted the disease distinctly hypernormal levels of vitamin C were found in the central nervous system. Why certain individuals can attain this level of storage of the vitamins and others cannot remains unexplained.[12] A simple method of determining the vitamin C content of the blood has been devised,[13] and by its use it has been demonstrated that there is always a higher ascorbic acid content of the foetal than of the maternal blood. It was often twice as high and once was found to be four times as high. This week Drs. Portnoy and Wilkinson give an account at page 554 of an investigation into the vitamin C content of the blood and of urine of normal persons, patients with peptic ulceration, and patients with haematemesis. The six different methods of examination used all gave comparable results. All the patients with peptic ulceration or with haematemesis were observed to be suffering from severe vitamin C deficiency, and vitamin C therapy was strongly recommended. Mr. Geoffrey Bourne of the University of Sydney, using the capillary resistance test (as recommended by Göthlin), at page 560 confirms Portnoy and Wilkinson's findings in hospital patients with gastric or duodenal ulcer and on a dietary regimen deemed suitable for this condition. There was, however, no evidence from the records that such a deficiency in the diet was responsible for the development of peptic ulcer.

After all the discussion of methods of determining whether a person's intake of ascorbic acid is adequate or not, it is a relief to know that the ascorbic acid content of fruits and vegetables (or at least of most of them) can be determined with a fair degree of accuracy.[14] The increase in the amount of vitamin C can be followed as the fruit ripens, and comparisons between different varieties, at the same times and in similar degrees of ripeness, can be made. The whole trend of research on vitamin C in recent years well illustrates Galileo's precept: "To measure all things that can be measured and to make measurable all things which cannot yet be measured."

[10] *Klin. Wschr.*, 1937, **16**, 1313.
[11] Ibid., 1453.
[12] *J. exp. Med.*, 1937, **66**, 459, 479.
[13] *Klin. Wschr.*, 1937, **16**, 1496, 1498.
[14] *Analyst*, 1938, **63**, 21.

BUILDINGS FOR HEALTH

The genius of the architect has for ages been evident in buildings for worship and for government, and more recently for commerce and industry, but it still seems strange, though it should not, for the word architecture to be used in association with buildings or lay-outs intended for sport, physical training, and the health concerns of a community. The Royal Institute of British Architects has arranged an exhibition, which is open at its premises in Portland Place, London, W., until the end of the month, to illustrate, chiefly by photographs, how the architect's intervention causes the best use to be made of the available space and material, and results in buildings which not only serve their purpose but satisfy the eye. It is no small gain if, at a time when recreative physical training is being so strongly urged, the places intended for sport and recreation, the baths, stadiums, rinks, and so forth, are given a certain grace and dignity. They should not be pompous, the prevailing note should be simplicity and gaiety, and it needs the trained architect to impart it. The exhibition is in four sections. One of them illustrates town planning, with suggestions for the best arrangement of open spaces and park ways; another is concerned with healthy living and working conditions in houses, factories, and streets; a third, with the public services, sanitation, and so forth; and a fourth, with the processing, distribution, and

preparation of food. In addition to the photographs a large model has been constructed, measuring some 230 square feet, of an ideal sports centre for a provincial town of some quarter of a million inhabitants. It is intended to show local authorities the kind of thing that can be done, with Government assistance, under the Physical Training Act. One of the first schemes to be put in hand under that Act is at Stockton-on-Tees, and of this a sketch design is shown. It is a space 28 acres in extent, with a stadium, gymnasium, swimming-bath, tennis courts, and provision for other games, as well as a children's playground.

On public baths and stadiums the old Romans exercised their skill, but if this exhibition is a fair index to what is taking place, especially on the Continent, the modern architect is well in line with those of his calling who flourished in the time of Titus and Diocletian. One instance in this country is the Stoke Park swimming-bath at Guildford, but a large number of photographs are shown of swimming-baths in Germany, Italy, and Switzerland which are on a very ambitious scale. A model has also been sent from Berlin of the Olympic stadium and physical training centre there. In the section dealing with housing and factories the value of good natural lighting is emphasized, as can well be done by means of photographs. It is also encouraging to notice from how many parts of industrial England come illustrations of excellent provision for pithead baths at collieries, washing facilities in factories, also works canteens and other arrangements for the comfort and health of the worker.

The architect claims to play his part in preventive medicine, and shows in evidence modern works for refuse disposal, water supply, and food distribution. In many of these respects, and especially in the arrangements of classrooms in schools, the cleansing of streets, and farmyard hygiene, the present generation can give itself a pat on the back; but there are plenty of photographs of things as they are to-day to recall it to humbleness, especially the pall of smoke over towns. The exhibition is full of human interest; those who have looked upon utilitarian architecture as a flavourless subject, lacking in emotional quality, will be pleasantly disillusioned.

HOST SUSCEPTIBILITY TO COLDS

In an amusing letter some time ago Dr. L. W. Batten[1] tilted at the present enthusiasm for nutrition, and pointed out that the well-fed population of Hampstead were heirs to all the common ills of the flesh. "What matters is that we leave behind the strain and stress of responsible work, the town, its clothes and its crowds, we live simply out of doors and we exert our muscles. The minor ailments and the malaise, which have withstood excellent dieting for months, vanish in a week." Experiments by Spiesman and Arnold[2] on susceptibility to the common cold support the view that activity of the skin and exercise in the open air are at least as important as good diet in the avoidance of infection. They classify colds into infectious and allergic groups. Even when protein hypersensitivity cannot be demonstrated by skin reactions the two varieties of cold can usually be differentiated by the history and by the character of the nasal secretions, which become mucopurulent with infection but remain serous and eosinophilic with the allergic reaction. Infectious colds can be subdivided into true influenza and epidemic catarrh or the common cold. Influenza is a frank infection but there is a good deal of evidence that the seasonal incidence of the common cold is not explained by overcrowding in bad weather and increased opportunities for infection, but that it is due to disturbances in the heat-regulating function of man as a result of climatic changes. Leonard Hill observed that the nasal mucosa was affected by changes in the temperature and humidity of the environment. The mucosa of the nose becomes flushed and swells when the subject is placed in a moist warm atmosphere; when he passes to a cold atmosphere the mucosa quickly becomes pale from constriction of the blood vessels but still remains thickened and swollen. Spiesman and Arnold found that the individual suffering from repeated infectious colds has an altered vasomotor reaction of the upper respiratory mucosa to thermal stimuli applied to the skin. In the normal individual the temperature of the nasal mucosa falls abruptly with the application of a cold stimulus to the skin, and then gradually recovers and returns to approximately normal within ten minutes, even though the stimulus is still applied. In the individual with frequent colds vasoconstriction in the nasal mucosa is much more gradual and persists for from several minutes to two hours. In the hypersensitive or allergic subject the reaction of the nasal mucosa is the opposite of normal—an increased temperature when a cold stimulus is applied to the skin and a decreased temperature when heat is applied. The best preventive measure in colds of both groups, the infectious and the allergic, was found to be vasomotor massage, which was applied to the subjects in their own homes, each receiving instructions to take a hot bath and a cool or cold shower when rising each morning and to repeat this if possible each evening before dinner. At first all products made from wheat—that is, white-flour breads, pastries, pies, etc.—were eliminated from the diet, and afterwards over-indulgence in carbohydrates was still guarded against. Physical exercise was looked upon as an important adjunct of the daily regime, and the mental state was also important, as any worry or mental strain tended to offset the advantages derived from hydrotherapy and diet. With such treatment the vasomotor response returns to the normal pattern, there is an absence of head colds, and the subjects enjoy a better state of well-being and continue the hygienic treatment for this reason.

[1] *Lancet*, 1936, **2**, 286.

[2] *Amer. J. Digest. Dis. Nutrit.*, 1937, **4**, 438.

PERIPHERAL NERVE PAIN OF VERTEBRAL ORIGIN

Advances in the technique of radiography have made it clear that disorders of peripheral nerve function are often due to minor abnormalities or disease of the vertebral column. The work of Schmorl and his colleagues in Dresden, fully described in Beadle's monograph, has demonstrated the importance of lesions of the intervertebral disks in this connexion. The peripheral nerve pains which are a feature of the premonitory stages of ankylosing spondylitis, and which appear before any bony change can be detected, are without doubt due to irritation of the nerve roots in the region of the foramina. Hilton Fagge[1] described a plastic exudate enveloping the vertebral bodies, and it seems clear that the inflammation which precedes the calcareous deposition will affect the nerve roots in this part of their course. The pains become less severe as the inflammatory tissue gives place to bone, and it is rare at this stage for the foramina to be encroached upon. Nathan[2] studied the development of epidural and peri-radicular exudation in ankylosing spondylitis and by experiments upon dogs; he demonstrated that such exudations occurred in the early stages of the disease, and gave rise to sensory alterations of root distribution. Bechterew noted peripheral pains as a conspicuous feature in his cases of spondylitis of a different type, but in these cases there was meningeal inflammation, which appeared to spread to the cord itself. In spinal osteoarthritis there is no inflammatory stage. In this condition Garcin and Deparis[3] noted that the peripheral nerve symptoms were often on the opposite side to that on which *x* rays revealed the presence of osteophytes. They suggested that this might be due to osteophytes in the course of formation and not yet opaque to the rays. Study of the changes which take place in the disks indicates, however, that the symptoms are less likely to be produced by the actual pressure of osteophytes, though this may occur, than by the narrowing of the foramina, which is the result of compression and thinning of the disk, and allows the vertebral bodies to come closer together. The presence of an osteophyte may lead to the compression being greater on the opposite side by leading to uneven thinning of the disk—this seems to offer a more probable explanation than that given by Garcin and Deparis. Peripheral nerve pains from such a cause are more likely to arise in the distribution of the lower cervical and lumbar roots since these roots almost fill the foramina. That sciatica is often the result of narrowing of the foramen of the fifth lumbar nerve root is well known, and brachialgia is sometimes due to a similar condition. Alterations in the shape of the vertebral bodies are often seen in profile radiographs of the cervical spine and may be secondary to changes in the disk or be due to trauma or infection. They are commonly associated with pain in the peripheral distribution of the cervical roots and even give rise to precordial pain of anginal type. Actual subluxation sometimes occurs, and this is a serious risk in manipulative procedures in unskilled hands. Osteophytes are most frequent in the regions of greatest mobility—namely, the cervical and the upper lumbar region—and probably arise from intermittent tension on the lateral ligaments as a result of the increased mobility between adjacent bodies due to thinning of the disks. To describe these conditions the ugly and unnecessary term "discogenetic" disease has been coined by Albert Oppenheimer[4] in an article which contains some interesting observations on narrowing of the intervertebral foramina as a cause of pseudo-rheumatic pain. He has, however, given credit to certain writers for originality of observations which had been made by others at an earlier date. It is not uncommon for credit to be given to radiography for discoveries made by the great clinicians of the past and now forgotten. It may be worth while to observe that even when radiography shows gross abnormalities peripheral nerve pain may result from some other cause; careful clinical examination should therefore never be neglected.

[1] *Trans. path. Soc.*, 1877, **28**, 201.
[2] *Amer. J. med. Sci.*, 1916, **152**, 667.
[3] *Rev. méd. franç.*, 1934, **15**, 387.

B.C.G. VACCINATION IN CALVES

The favourable results obtained by Stanley Griffith, Buxton, and Glover[5] in the experimental immunization of calves with B.C.G. find confirmation in a fully documented report[6] from the Istituto Vaccinogeno Antitubercolare of Milan, directed by Professor Ascoli. The investigation dealt with a total of ninety-four calves, and the immunizing effect of virulent human bacilli, living B.C.G., killed B.C.G., and killed virulent human bacilli, administered either subcutaneously or intravenously, was tested against subsequent infection with virulent bovine bacilli. This infection was carried out either by administering a culture or by allowing the calves to cohabit with tuberculous cows. In the latter case two sets of experiments were done: one group of calves were allowed to live with the tuberculous animals immediately after vaccination, another only after an interval which allowed for any immunizing effect to be established. The results obtained may be summarized as follows. Intravenous and subcutaneous vaccination with B.C.G. or with human bacilli appreciably increased the power of resistance, which prevented the development of tuberculous lesions in calves injected later with doses of virulent bovine bacilli that caused rapid death of all the controls from miliary tuberculous pneumonia. Repeated vaccination improved these results, but immunity was not obtained against ten times the lethal dose. Vaccination with bacilli killed by heat, even if repeated, never under the same conditions prevented the development of tuberculous lesions, although it increased the survival time of some of the calves; the same treatment did not protect them from natural contagion, nor did various modifications in administering the dead bacilli. Calves vaccinated intravenously with killed bacilli, when no

[4] *Ann. Surg.*, 1937, **106**, 428.
[5] *Lancet*, 1935, **1**, 451.
[6] *Esperimenti di Vaccinazione Antitubercolare eseguiti sotto il controllo del Comitato Tecnico-Scientifico dell' Istituto Vaccinogeno Antitubercolare.* Relazione stesa dal Professatore Alberto Ascoli.

precautionary measures of isolation were taken, showed, when slaughtered, tuberculous lesions in a much greater proportion than did the controls, suggesting that the vaccination might have had a predisposing rather than an immunizing action. Under the same conditions animals vaccinated with living B.C.G. contracted infection to the same degree as the controls. On the other hand, when precautions were taken to isolate the vaccinated calves for a certain period, during which they were fed on milk free from tubercle bacilli, B.C.G. conferred considerable resisting power, both against natural contagion and against artificial infection. In one experiment where the infecting dose was large enough to kill all the unvaccinated calves and those treated with killed bacilli, out of the five calves vaccinated with B.C.G. four were "unharmed" and one showed small nodules in a mesenteric gland. In another experiment none of the four calves vaccinated with B.C.G. or with live human bacilli contracted the infection, although the infection was enough to cause the development of tuberculous lesions in three out of four animals in each of the other groups—that is, those not vaccinated or vaccinated with dead bacilli.

TREATMENT OF VARICOSE VEINS

For many years it was customary to treat varicose veins by operation alone. When the injection treatment became popular this was for some time employed exclusively. To-day a combination of both operative and injection methods is current practice—a practice discussed at length in two recent papers.[1] [2] In 1932, when the Hutchinson Memorial Clinic of Tulane University was first opened, varicose veins of the lower extremities were treated entirely by the injection method, but with many disappointing results. The injection treatment is adequate for relatively small and isolated varices, but where there is incompetence of the valves of the veins communicating between the main deep and superficial systems—a fact which can be ascertained by a modified Trendelenburg test described in the papers referred to—injection should be combined with ligation. Of the varicose veins in 247 women 60 per cent. were associated with pregnancy; the other important factor in aetiology was heredity. In one series there were 57.5 per cent. of recurrences in patients who had received injections of sclerosing solutions alone, whereas there were only 18 per cent. of recurrences in those whose saphenous veins had been ligated and divided at the fossa ovalis in addition to having the veins injected.

PROGRESS IN PAEDIATRICS

Edited by Professor I. A. Abt with the help of Dr. A. F. Abt, *The 1937 Year Book of Pediatrics*[3] presents a valuable summary of progress in many directions in disorders of children. Readers of earlier volumes in this series will be glad to learn that the editorial comments are continued and are as concise as ever. For example, after a very fair presentation of the papers published on the subject of the treatment of whooping-cough, the editor remarks: "The use of ascorbic acid in treatment of whooping-cough reminds us that nearly every newly discovered remedy in ancient and modern times has at one time been advocated for treatment of this disease." This indicates the type of approach made, and it is a matter for regret that there is not more "Abt" and less of what other people think. Random sampling and a study of the index indicate that contributions from the British Isles are few in number, which is either a mild injustice or a mild reproof for poverty of material. In either case paediatricians in this country should not let this prevent them studying the work set out, which represents in main the current paediatric practice of the North American Continent.

[1] *Surgery*, 1937, **2**, 889.
[2] Ibid., 903.
[3] Chicago: The Year Book Publishers. London: H. K. Lewis and Co., Ltd. (10s. 6d., postage 6d.)

TUBERCULOSIS IN CYPRUS

An account of the mission to Cyprus of the National Association for the Prevention of Tuberculosis has already been given in this *Journal*, on July 3, 1937 (p. 30). A fully documented report[4] by Dr. Noel Bardswell, the special commissioner appointed for the purpose, has now been issued. The difficulties met with in conducting the inquiry into the incidence of tuberculosis in this backward island are well brought out. The methods adopted consisted of personal questioning, physical examination, and Moro-testing of samples of the population in various districts. 8,084 children in villages and 1,841 in district towns were tested; 6.5 per cent. were found positive in the villages and 8.2 in the towns. Dr. Bardswell concludes that the problem of tuberculosis in the island is not as grave as had been generally believed here. The report is also of interest in that it furnishes a good description of the mentality, habits, and living conditions of the inhabitants. Dr. Bardswell is continuing his investigations, and hopes to lay down a scheme which will bring the disease under control. The work is of value not only in providing data of the disease in Cyprus but also in giving an opportunity to study the spread of tuberculosis in a primitive community.

We regret to announce the death on Wednesday morning of Sir Raymond Crawfurd, consulting physician to King's College Hospital and registrar of the Royal College of Physicians of London.

[4] *Tuberculosis in Cyprus*. An Interim Report on its Incidence and Means of Control. By Noel Dean Bardswell. London: Adlard and Son. (2s. 6d.)

Under the editorship of Dr. E. Arnold Carmichael the *Journal of Neurology and Psychopathology* resumed publication in January last with the new title of the *Journal of Neurology and Psychiatry*. The demand for this special publication of the British Medical Association has exceeded expectations, and at the moment it is out of print. Arrangements have been made, however, for the reprinting of a limited number of copies. Intending subscribers should make early application to the Secretary, B.M.A. House, Tavistock Square, W.C.1, to ensure the receipt of the January issue, the first number of a new volume.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

TREATMENT OF MUSCLE INJURIES

BY

C. MAX PAGE, F.R.C.S.

Minor isolated injuries to muscles are commonplace, but on account of the elasticity of structure of these organs such injuries are seldom the source of serious disability. When the trauma is more severe other structures will very likely be damaged as well. For example, in most fractures of long bones some laceration of the overlying muscles is necessarily involved. In severe contusions of the abdominal muscles the underlying viscera may be damaged. In these examples consideration of the muscle injury is a secondary matter. The repair of cut or torn muscle is effected by the formation of fibrous tissue from the granuloma formed in and about the primary exudate of blood and serum. Reproduction of new muscle fibre does not occur. When repair by fibrous tissue formation is complete the function of the injured muscle is rapidly restored by normal use if the separation of the fragments has not been excessive.

For the purposes of this contribution muscle injuries may conveniently be divided into four groups—namely: (1) open wounds (cuts and missile wounds); (2) direct injuries (closed)—contusions and ruptures; (3) indirect injuries—ruptures in long-bellied muscles; (4) strains—localized minor injuries at muscle insertions or muscle-tendon junctions. In addition myositis ossificans and ischaemic contracture are touched on, though properly these do not come within the scope of the present series.

Open Wounds

Damaged muscle and muscle haematoma form a favourable bed for the development of anaerobic infection. An immediate and careful wound excision under anaesthesia should therefore be carried out in any instance in which there is a suspicion of serious bacterial contamination in wounds involving muscle. The excision or débridement should be effected not later than twelve hours after injury. Antiseptic lavage is a poor substitute for the above method unless it be employed very soon after the event and the wound happens to be clean-cut and freely open.

No attempt should be made to suture muscle or tendon at the primary operation in any case where serious contamination is probable. As a secondary procedure when the wound is healed it may occasionally be worth while, especially when tendon has been involved. Prophylactic injection of anti-tetanic serum and anti-gas serum should be given if earth or faecal contamination is suspected. In case of spreading infection from the primary wound the general principles of wound treatment should be applied. Once infection is past and the wound is healed restoration of function should proceed on the lines laid down below.

Direct Injuries (Closed)

Contusions and closed laceration of muscle result commonly from kicks sustained at football. The immediate treatment will be to apply a firm strapping or bandage to support the injured part and to limit the effusion of blood. In practice these injuries must often affect the gluteal and thigh muscles, and effective support in those situations is not very easily applied. An adhesive elastic bandage is usually most effective. A few days after the injury gentle massage may assist the absorption of the smaller bruises. If the injury is more extensive a longer period of rest is advisable; a definite haematoma will probably form, and massage of this will serve no useful purpose, and indeed may be harmful by renewing haemorrhage and delaying the repair process.

MUSCLE HAEMATOMATA

Small haematomata, if rested, will be absorbed in a week or so, and treatment to restore function can then proceed on normal lines. Large haematomata as met with most commonly in the gluteal region or thigh are best left untouched for ten to fourteen days or even longer. The clot will by then have shrunk down, leaving a serous cyst. At this stage evacuation by aspiration or through a stab incision will expedite the healing process. If the haematoma is not evacuated a blood cyst will probably form and will be slow to absorb, and the restoration of function will be correspondingly delayed. Suppuration occasionally occurs in a neglected haematoma. Evacuation of the pus by incision is then called for. Drainage, if employed, will be necessary only for a day or so.

Complete rupture of a muscle from direct violence is uncommon. The rectus femoris is the most often affected. A wide gap is formed, and suture of the torn ends may seem the proper procedure. In my experience the attempt is of no value unless the tear is in tendon or at the insertion into bone—for example, in the tendo Achillis or at the quadriceps insertion into the patella. In these cases, due nearly always to indirect violence, prompt suture is good practice. When a fleshy part of a muscle is ruptured repair by fibrosis occurs, and though a permanent alteration in the form of the muscle may be caused, little interference with function will ensue.

Indirect Injuries

Rupture of contracting muscle by its own force occurs as a rule in the muscular middle-aged taking unusual exercise, but sometimes in a relatively young man as a result of sudden severe physical effort. Some individuals are peculiarly liable to ruptures of this kind, and must be regarded as brittle-muscled. The commonest seat of these injuries is in the calf of the leg; the rupture may involve any part of this from the tendo Achillis to a few fibres in the gastrocnemius. At the time of the injury the patient feels as though he had been hit in the back of the leg with a stick, and he very likely falls to the ground. The hamstrings may be similarly affected, but the injury is not as a rule so disabling in its effects. In the case of the long head of the biceps cubiti the tear is usually in the tendon and in that part which passes through the shoulder-joint. The injury generally occurs in association with osteo-arthritis of the joint, the disease process having caused some disintegration of the tendon. The injury leaves an unsightly arm but much less disability than might be expected. Suture of the tendon to the biceps groove is worth while in a youngish man.

The diagnosis in these cases is made by the history associated with the presence of localized tenderness at the

seat of the rupture. As a rule there is no immediate haematoma, though a measure of this will develop in accordance with the extent of muscle and vessel injury. The large haematomata associated with direct injuries are seldom if ever seen.

TREATMENT

In the case of a partial rupture of the calf muscles, unless very severe, the treatment can be on ambulatory lines. The foot is placed in the plantar-flexed position and elastoplast or adhesive strapping applied from the calf down to and including the sole of the foot. A firm bandage over all will stabilize the application. After a few days the patient is allowed to walk with the strapping in place and the heel of the injured side elevated half to three-quarters of an inch so as to keep the muscle relatively relaxed, the foot being in the position of talipes equinus.

The more serious condition of rupture, partial or complete, of the tendo Achillis, which arises in a similar way, is dealt with in a previous section. The condition has also been observed in the rectus abdominis, occasionally in healthy people and as a complication of tetanic spasms. In rare cases the muscle has undergone a degeneration which makes it abnormally brittle. The treatment is on the lines laid down above. I do not think that operative treatment is of any value unless the rupture has been through a tendinous part of the muscle.

RESTORATION OF FUNCTION

Whatever the extent or cause of the primary injury to a muscle some degree of disability immediately results. Treatment directed to the restoration of full function should be based on similar lines for all cases, the severity of the injury determining the time required for complete recovery. Light massage a few days after injury will be comforting and will assist the absorption of minor haematomata. Massage in the presence of larger haematomata is unsound. Subsequently the use of the injured muscle by graded exercise is the most effective means, and the degree to which this is pressed will depend on the extent of the primary injury. In severe cases, and for those patients who are little inclined to help themselves, the use of gentle faradic stimulation will be helpful. This should not be employed until the haematoma has been absorbed and the repair process is well advanced—normally two or three weeks after the more serious injuries. Other physiotherapeutic measures are advocated, but, though mostly harmless, they play a very secondary part compared with graduated voluntary exercise in restoring the full use of the injured muscle.

Strains

An initial strain may rupture a few fibres at a muscle tendon junction or insertion. If the initial injury is not treated conservatively subsequent use of the muscle before it is restored to normality may result in a chronic effusion at the site of injury which causes pain from the tension produced by contraction of the muscle. Calcification or ossification is sometimes observed in the strained tendon. This condition is most often seen in the origin of the adductor muscles, and occasionally develops in the origin of the common extensor of the forearm and in the insertion of the deltoid muscle.

Treatment should be directed towards sparing the muscle involved from severe stress for a few weeks, while maintaining its condition by faradism and gentle exercise. Local treatment of a counter-irritant character is not often effective. In some cases the presence of focal sepsis may be a cause of the continued irritation. The removal of dead teeth or other source of toxaemia may clear up the trouble.

Myositis Ossificans

This is a condition in which bone is formed in the substance of or immediately deep to a muscle. Its appearance is usually secondary to an injury which allows bone-forming cells to penetrate the haematoma of a muscle injury. It is most commonly seen as a complication of fractures and dislocations in the elbow-joint region. It is also observed from time to time in relation to the central part of a long bone, but for some reason it is relatively uncommon in this situation. It may also occur without a gross bone injury. This is seen in the thigh following a severe kick or even after the too firm application of a tourniquet. The result of this bone formation may be to limit the movement of the neighbouring joint either by muscle fixation, as is seen when the quadriceps is involved, or, by forming a bony block, checking movement by contact with the neighbouring bones, a state not uncommon about the elbow-joint. The condition itself is painless unless movement is roughly forced, but it may interfere very seriously with the function of the limb.

TREATMENT

In a case in which the irregular bone has recently formed complete rest of the part is essential. This is best procured by fixation of the affected limb in plaster-of-Paris. In the course of a month or so this usually leads to absorption of the unwanted bone. Forced movement will continue to irritate the new formation, preventing its absorption and even causing increase in its bulk. The period of rest necessary for complete absorption varies considerably, and is shorter in children than in adults. In the latter one may have to wait as long as six months before attempting to restore function. Operation for the removal of bone tissue is only justifiable when the condition has existed for a year or more, and when a definite formation that is blocking joint movement is present.

Volkmann's Ischaemic Contracture

Though Volkmann's contracture is not primarily an injury of muscle, reference may be made to it here on account of its clinical importance. It is due to an interstitial fibrosis of the muscle which follows necrosis of greater or lesser amounts of muscle tissue from ischaemia. The condition is initiated by depriving muscle of its blood supply, partially or completely, for a relatively short time. The mechanism by which this temporary anaemia is brought about is usually a tight application of splints over an unreduced fracture. Occasionally a progressive effusion of blood beneath the fascial plane may produce the effect. It would seem that tourniquet pressure seldom, if ever, has the same result. At times partial or complete interference with the nerve supply to the part complicates the issue. For practical purposes the condition is met with in the flexor muscles of the forearm, and is most commonly noted after a supracondylar fracture in childhood. Some authorities state that the condition is never seen in the adult—a statement true only of the more severe form.

TREATMENT

It is quite clear that prophylaxis is of the first importance. In fractures in the region above mentioned subfascial tension must be avoided or relieved as soon as possible. In the application of any rigid fixation to the arm there must be no undue tension, whether it be by bandage, splint, or bone pressure on major vessels. The

danger signals are a dusky blue appearance of the hand on the injured side and obstruction of the normal radial pulse. When these are observed action should be prompt either to relieve pressure of bandages and splints or to rectify the position at the seat of fracture.

Once the condition of fibrosis and contracture is established, it may, if not too severe, be considerably improved by graduated stretching of hand and wrist by suitable splintage. Various operative treatments have been devised for the more severe forms, but a consideration of them hardly comes within the scope of this article.

HEALTH OF THE NAVY

The report on the health of the Navy for 1935 (H.M. Stationery Office, 2s. 6d.) records a further decrease in the incidence of disease and injury. The America and West Indies Station showed the lowest sick rate. Improvement is especially noticeable in the incidence of diseases of the respiratory system. In 1935 there were 1,279 cases, in 1934 1,526, and in 1933 3,494. The causes of death in this group during the year under review were bronchopneumonia 5, gangrene of the lungs 1, and mediastinal abscess 1.

Infective Diseases

Despite the concentration, during the last quarter of the year, of large numbers of men at bases in the Eastern Mediterranean, where bacillary dysentery is prevalent, the increase in the case ratio for this disease was only very slight. From the China Station twenty-three fresh infections of dysentery are recorded. Ten of these were amoebic, and the report states that the favourable impression formed of the value of carbarsone (Lilly) in the treatment of amoebic dysentery was further confirmed. In several cases intercurrent tachycardia, attributed to emetine, was noted. Only nine cases, five of typhoid and four of paratyphoid, occurred in the enteric group, and this small incidence among so large a number of men at risk all over the world may be regarded as a tribute to modern preventive medicine.

One case of filariasis was returned by H.M.S. *Achilles* (Home Fleet). The infection was traced to previous foreign service in the Yangtse Valley. For three years the officer affected had suffered from recurrent skin conditions resembling erysipelas or cellulitis with lymphangitis. The diagnosis was ultimately confirmed by the finding of *Filaria loa* in his blood at midnight. The single case of leishmaniasis recorded also occurred on the Home Station. The officer affected had recently returned from the Persian Gulf. Oriental sores appeared on the right arm and left leg, and Leishman-Donovan bodies, intracellular and extracellular, were demonstrated. A course of intravenous injections of sodium antimony tartrate effected a complete cure.

The report records a decrease in the number of cases of malaria from 255 in 1934 to 180 in 1935. The East Indies Station again returns the highest incidence, although its ratio per thousand is more than halved. The largest number of cases in any one ship was twenty-two in H.M.S. *Endeavour*. The cases occurred during a two-months survey of the islands north of Penang. Prophylactic quinine was taken daily, but frequently parties had to spend the night ashore in camp. With regard to treatment a single course of atebrin, followed by plasmoquine, was administered to all cases at the R.N. Hospital, Hong Kong. In Ceylon, however, it is stated that the newer remedies proved disappointing, especially as regards the relapse rate, and reliance was placed on intramuscular and oral quinine.

Schistosomiasis japonicum

All of the twelve ratings whose infection with this disease at Chinkiang on the China Station was described in the previous report[1] were kept under observation during the following year, but no positive findings of ova were notified. The most severe of these cases, however, a stoker aged 30, showed signs of damage to the pyramidal tracts and involvement of the higher centres. After a long course of hospital treatment at Hankow, Hong Kong, and Chatham, he was finally invalided out of the service. Only one fresh case of this disease was reported in 1935. This case is of unusual interest. While serving in the Home Fleet an officer, aged 30, had an epileptiform attack in the wardroom of his ship; another attack followed two days later. This officer had returned from three years' service in China in 1933, but he gave no history of tropical disease. A third seizure occurred a week after his admission to Haslar Hospital. Each attack was preceded by a feeling of "weight and tenderness" over the left parietal region and by a temporary "black-out" of vision. Examination revealed a small paracentral scotoma in the inferior temporal quadrant of the left field. A provisional diagnosis of cerebral tumour in the cortex of the left temporo-parietal region was made. Operation revealed a firm yellow spherical tumour, about one inch in diameter, and fairly sharply demarcated from the surrounding brain tissue. This was removed, and subsequent examination showed it to be made up of the ova of *Schistosomum japonicum*. Although a temporary paralysis of the right arm and difficulty in speech followed the operation the patient eventually made a good recovery and returned to duty.

[1] See *British Medical Journal*, October 10, 1936, p. 726.

TUBERCULOSIS ASSOCIATION AT OXFORD

The annual provincial meeting of the Tuberculosis Association will be held at the Dunn Laboratories, Oxford, from April 7 to 9. Accommodation for a limited number of men will be available at Exeter College; ladies and those who do not wish to have rooms in College should make early application for hotel accommodation. The charges (exclusive of a 10 per cent. tip to be added to the bill) are as follows: for all meals, including the annual dinner and accommodation in College, £2; for lunch and dinner but no accommodation in College, £1 5s.; for the annual dinner with wine, 11s. Those who do not take wine should deduct 4s. from these amounts. Meals and accommodation are from midday Thursday to midday Saturday, including lunch on both days. Members of the Tuberculosis Association should send cheques for the amounts to Dr. F. R. G. Heaf, Manson House, 26, Portland Place, W.1, by March 31, when the tickets will be sent to them. Guests may be invited on these terms. On the first day of the annual meeting papers will be read on the incidence of tuberculosis in young adult women, with special reference to employment, and later that afternoon problem cases will be discussed by Professor Girdlestone, F.R.C.S., and Dr. W. Stobie. It is suggested that an entertainment should be held in the evening. During the morning of April 8 papers will be read on extra-pleural pneumothorax, and what can be done to prevent the tuberculous patient from relapsing. In the afternoon visits will be paid to the Wingfield Morris Hospital and the Osler Pavilion, where tea will be taken. In the evening the president's reception will take place at Exeter College, followed by the annual dinner. On the morning of Saturday, April 9, papers will be read on the progress of radiology by Dr. Felix Fleschner of Vienna and others, and at 12.30 p.m. the annual meeting of the association will be held. Further information may be obtained from Dr. N. England, 1, Becket Street, Oxford.

It was decided at a recent meeting of the Oxford Graduates' Medical Club to extend the membership to all medical graduates of the University of Oxford and to abolish the subscription to the club. The secretaries are anxious to make the list of members accurate and complete, and would be glad to receive the names and addresses, with details of colleges and hospitals, and the date of taking the B.A. degree, from those who become members of the club under the new constitution.

THE TREATMENT OF DIABETES

SECOND LETTSOMIAN LECTURE

In his second Lettsomian Lecture, delivered at the Medical Society of London on March 2, Dr. GEORGE GRAHAM continued his survey of the changes and results of treatment of diabetes in the last fifteen years. A report of the first lecture appeared on March 5 (p. 529).

Dr. Graham said that the majority of the patients whose disease was severe enough to require insulin were easily controlled. The blood sugar could be kept within normal limits and the urine never contained sugar or acetone bodies. Some of these patients never had hypoglycaemic attacks, or, if they did, the attacks were mild and easily recognized and caused no real inconvenience. The condition might tend to improve so that in some cases the insulin could be abandoned, or it remained stationary, but the patient was liable to temporary upsets which could be traced to specific causes like illness or injury. If the dose of insulin was increased sufficiently as soon as possible after glycosuria and hyperglycaemia occurred, the diabetic condition might not be made worse and the dose of insulin might be decreased again to the original level. The dose of insulin required by patients of this type might be very large.

So far he had spoken of the disease which got better or remained stationary, but there were unfortunately many cases in which the disease progressed. This might occur early in the history or, on the contrary, after the disease had taken a mild course for several years. The patient might pass sugar before one or other or both doses of insulin, and when the dose of insulin was increased to prevent the hyperglycaemia he might suffer from hypoglycaemia either at midday or during the night. The condition bore no relation to the size of the dose of insulin, for the symptoms might occur with quite small doses or with large. The action seemed to be due to two factors: (1) the insulin acted more quickly so that the blood sugar rapidly decreased; (2) the effect of insulin on the blood sugar no longer lasted ten to twelve hours, but only eight to ten.

Insulin Resistance

An important type of case was that which was known as "insulin-resistant." In extreme cases of this kind very large amounts of insulin were given without producing any effect on the blood sugar. Thus Miller and Heimak gave 300 units, then 500 units, and finally 1,000 units a day, and in spite of this the patient died in coma. Root gave 525, 840, and finally 1,680 units in the last three days of life without preventing death in coma. Both these patients had haemochromatosis, and the liver was practically destroyed. In the less severe cases 200 to 400 units might be required before any effect was produced. Dr. Graham related certain observations of his own which he said suggested that some interfering substance was present which neutralized the insulin, but that the usual effects were obtained if sufficient insulin were given. The liver appeared to play some important part in the insulin-sugar mechanism.

Insulin Tolerance

It was important to consider what was happening to a healthy person who could tolerate 100 units a day without developing hypoglycaemia. Did he have to produce this amount of insulin over and above that which an insulin-sensitive subject required? Or did he produce the same amount because there was no difference between the indigenous insulin and that injected? Further, what would happen to this man if he developed diabetes? Would he straightway require more than 100 units before the blood sugar could be controlled? Dr. Graham answered this question by relating a case which had puzzled him profoundly, and from this case and another he deduced that when a healthy person who could take 25 to 100 units of insulin a day without having hypoglycaemia developed diabetes he would need large amounts of insulin before the diabetes was controlled, and that the amount of insulin was not a certain guide to the severity of the diabetes. If the patients improved they would not have overdoses, but would continue with their large dose of insulin although it might now be unnecessary. The diagnosis could be made by reducing the insulin by 8 units a day and watching the blood and urine tests. If the patient still needed insulin the blood sugar one hour after a meal would rise above 180 mg. and glycosuria would occur. In such a case the doses of insulin should be increased at once. If the diabetic condition had recovered the blood sugar would not rise and glycosuria would not occur. The patient could then safely leave off insulin provided that the urine passed after the evening meal was tested regularly for sugar. He did not suppose there were many of these patients who were taking large doses of insulin which they no longer needed, but the possibility should be remembered.

Changes in Treatment

The most important change in treatment from the point of view of the patient's comfort was the great improvement in the diet. Diets before the Allen regime were very unpleasant owing to the necessity for eating a very large amount of meat and fat, together with the various diabetic foods. The latter contained little or no carbohydrate and were unpleasant and unsatisfying. The change from these high protein and fat foods to the low protein and low fat diets was a great relief to the patient. The "hunger day" was of value and easily tolerated by most patients, although some found it irksome. If it was repeated at very frequent intervals in the attempt to keep the blood sugar normal the patients usually found it almost intolerable. Insulin made it unnecessary to have any more "hunger days," but the improvement in the health of the patient, who had been kept alive with severe dieting, was so great that the diet was at first little altered. It was not until 1926–30 that the idea became prevalent that carbohydrate should be increased. High carbohydrate dieting was now largely used, though there was still a good deal of controversy over the amount of carbohydrate and fat which should be given. The average carbohydrate of the diet in his cases was 150 grammes, but it had a tendency to increase. He had the impression that at least 100 grammes of carbohydrate should be given, and if the patient could not take that amount insulin should be given and the carbohydrate raised to at least 130 grammes. Many patients, especially women over 60, did not wish to eat more than this amount. Young patients needed much more, and to them he was giving at least 150 grammes and increasing it to 200 or 230 for growing children. One of the complaints of diabetic patients, and especially of the women, had been the poorness of the tea meal, and an advantage of the new slow-acting insulins was the improvement which could be made in that meal.

The mortality rates of his patients had decreased since 1932, coinciding with the great increase in the carbohydrate of the diet, and he believed that the extra carbohydrate had improved the health of the patients so much that they were able to withstand illnesses like pneumonia and influenza and make good recoveries.

The other great advance had been made in the analysis of the foods and in the use of food-value tables. For the latter in this country a debt was due to the late Dr. Otto Leyton, who realized that English patients could not use food tables easily in which the amount of food was expressed as a percentage. Leyton thought that if the amounts of food which contained 5 grammes of

carbohydrate were calculated patients would exchange their foods much more easily, and accordingly Harrison and Lawrence extended this system, and in 1930 Lawrence and McCance re-analysed many foods and thought that certain fruits contained less carbohydrates than was supposed. Their investigation was continued by McCance and Widdowson, who repeated the work and found that the carbohydrate was more than had been thought. The changes made had been relatively slight, but he thought that a stable figure had now been reached. A large number of foods had been analysed, and patients had a considerable choice of foods and had no reason to complain of any restriction.

Nova et Vetera

BENEDICT ARNOLD, THE FIGHTING DRUGGIST

Commemoration of the 206th anniversary of George Washington's birth on February 22 recalls a striking personality with whom he was intimately associated at one period of his career. Benedict Arnold was born at Norwich, Connecticut, in 1741. Apprenticed to Donald and Joshua Lathrop, relatives of his mother, who owned the largest drugstore in the town and were also practising physicians, he picked up scraps of medicine and surgery. At the age of 21 he opened a shop of his own in New Haven, in those days a trading village of some five thousand inhabitants, having previously made several voyages to the West Indies and to London to buy drugs, books, and stationery. Over his store he put up the modest sign "B. Arnold, Druggist, Bookseller," with the motto "Sibi Totique." Business was successful from the first, and for thirteen years he was a leading and respected citizen of the community. At the outbreak of the American Revolution the "fighting druggist" left his shop for ever, organized a company of sixty volunteers, and started out for combat. His picturesque and heroic adventures have made his name almost as familiar in his country as that of Washington. One of his most celebrated feats is his march through the uninhabited Maine forests against Quebec, which for hardship and endurance is probably unparalleled in American history. At the Battle of Saratoga Arnold was the true hero, but Horatio Gates, apparently jealous of his fame, called him off the field, refusing to give him credit for a victory which marked the turning-point in the Revolution. This treatment embittered the proud and ambitious Arnold. And then Congress had promoted five junior officers over his head, in spite of Washington's protest. Next year we find him opening treasonable correspondence with Sir Henry Clinton, Commander-in-Chief of the British troops. Two years later he accepted the post at West Point with the intention of betraying this stronghold to the enemy. If he succeeded his reward was to be £20,000, and if he failed £10,000. Somehow the plot leaked out, and Arnold escaped to the British lines. He was appointed a Brigadier-General in the British Army and spent the remainder of his life in lonely and dishonoured exile in England and in Canada. He died in London in 1801. His story was told by William Abbatt in the *American Druggist*, 1900, **36**, 186, and his memory has recently been recalled by Clifford H. Rudes in the January number of the *Druggists' Forum*.

In 1838 Johannes Müller, teacher of Schleiden, Schwann, and Virchow, in his work "On the Finer Structure and Form of Morbid Tumours," established the cellular character of new growths. This landmark in the history of cancer has been commemorated by the New York Academy of Medicine, when Professor Howard W. Haggard read a paper entitled "The Conception of Cancer before and after Johannes Müller."

Reports of Societies

CAUSES AND TREATMENT OF FLATULENCE

At a meeting of the Medical Society of London on February 28, with Mr. J. E. H. ROBERTS in the chair, a discussion was held on the causes and treatment of flatulence.

Professor HENRY COHEN said that flatulence was one of the commonest of dyspeptic conditions, yet its mechanism was very little understood. Flatulence was a term often used by a patient in order to shield his own inability to describe his symptoms. Such symptoms as palpitation, nausea, constipation, headache, and cardiac pain were hidden in the usual complaint of flatulence. But "flatus" meant wind, and thus the essential symptoms must include wind or gas as an integral feature. There were five symptoms which might be complained of by a patient whose true complaint was flatulence. The first was belching or eructations; the second the passage of flatus per rectum in excessive amounts; the third a feeling of distension; the fourth gurgling or borborygmus; and the fifth pain or discomfort.

Flatulence could be defined as gas in the stomach or bowels, giving rise to discomforts which were relieved when the gas was expelled. The sources of gas in the alimentary tract were threefold: (1) swallowed air; (2) gas arising as a result of certain chemical changes; and (3)—a possibility, but not yet with certainty proved—the direct excretion of gases into the stomach and intestine from the blood stream. Four factors tended to modify the absorption of gas from the intestine. The first was the nature of the gas itself. Carbon dioxide was absorbed very rapidly, oxygen much more slowly, and nitrogen hardly at all. The first factor which tended to modify absorption, therefore, was the diffusion constant of the gas, and the second, the tendency of gas to combine with haemoglobin. The third factor was the diffusion of certain gases in the tissues themselves, and the fourth, the mucous membrane of the intestinal wall. If gases such as carbon dioxide and oxygen were absorbed into the blood stream, it was clear that any interference with the circulation in the gut would result in the accumulation of gases therein. This could be produced by any condition which caused venous stasis. Under normal conditions the amount of gas in the gut which was not absorbed was relatively small; its average composition was 10 per cent. carbon dioxide, 30 per cent. methane, and 60 per cent. nitrogen.

The Clinical Aspect

From the clinical standpoint flatulence might be divided into gastric and intestinal. Gastric flatulence was very largely the result of air-swallowing or aerophagy. Its most common symptom was a feeling of distension which was relieved by belching. Intestinal flatulence was much less commonly the result of aerophagy and much more commonly the result of fermentative processes. The division into gastric and intestinal flatulence was largely artificial, and it was far better to classify flatulence according to the mechanisms just described, although, of course, more than one mechanism might exist in any particular case. But the mechanisms described should enable certain types of flatulence to be recognized, and Professor Cohen considered each of five groups in turn.

The first of these was excessive air-swallowing or aerophagy. More air than usual might be swallowed because meals were hurried or mastication inadequate, or because there was excessive salivation, which last was responsible for the aerophagy in many post-operative conditions. Certain foods, such as omelettes and rusks, might, if taken quickly, carry more air into the stomach, and this was true of aerated water. But perhaps the commonest

cause of aerophagy was a different one. Any epigastric or substernal discomfort would almost certainly result in aerophagy as an attempted mechanism of relief. The trouble was that, like every habit spasm, it tended to go on after the cause had disappeared, and thus what was at first a purposive act became a tic. Having decided as to the mechanism, what was the obvious treatment? In the first place, the cause must be investigated with the greatest care. There were obvious causes like gastric ulcer or cancer, cancer of the oesophagus, and so on, but there were much less obvious causes, such as the early phase of angina pectoris, or some of the earlier manifestations of cirrhosis of the liver. To correct the deficiency, meals should be taken more leisurely, be relatively dry, salivation might be checked in certain cases by administering belladonna, and the rather sensitive nervous system treated by small doses of sedatives. What should not be done in aerophagy was to administer carminatives.

So much for aerophagy. Of the second group—delays and obstructions in the stomach and bowel—responsible for flatulence, these were very largely surgical conditions such as cicatricial stenosis in the stomach, giving rise to pyloric stenosis. A diverticulitis affecting the ascending colon was not an infrequent cause. Delay in the passage of food down the alimentary tract might be associated with spasm, and spastic colon was a cause of intestinal flatulence. It could also be associated with atony of the gut, and atonic constipation was again a not infrequent cause. The treatment of delays and obstructions must in the first place be directed towards the underlying lesion. The third group, consisting of fermentative activities in the gut, was a rather difficult field because so little was known of the subject. Two main types had been differentiated, one that of intestinal carbohydrate dyspepsia, and the other the cases occurring in intestinal affections in which there was excessive protein putrefaction. In the case of intestinal carbohydrate dyspepsia cereals should be avoided, also root vegetables, and in the protein forms of flatulence a lacto-vegetarian diet should be imposed. The fourth factor was a disturbance of the circulation in the intestinal wall. This was a factor not yet adequately assessed. The fifth factor was damage to the intestinal mucosa, not from toxins which arose in such diseases as typhoid and dysentery, but rather from poisons which one took optimistically and called purgatives and which undoubtedly irritated the mucous membrane of the stomach and intestine and promoted considerable interchange of gases and toxins which would not otherwise be allowed to pass through.

The treatment of any condition had not only to overcome the causes but to deal with symptoms. There were three main ways of dealing with symptoms: (1) the administration of carminatives; (2) the administration of absorbents such as charcoal and kaolin, neither of them a very effective remedy; and (3) particularly in post-operative flatulence, the passage of a tube for the removal of the gas.

Surgical Considerations

Mr. C. W. GORDON BRYAN thought there was a danger of being unduly impressed by the nervous or functional element in these cases and overlooking the organic causes of partial obstruction which could be removed by surgery. This applied especially to early or partial obstruction of the ascending or transverse colon where flatulence was commonly a permanent symptom. One problem in great need of solution was how best to treat cases of so-called visceroptosis of various types. In many of these cases the element of mechanical obstruction seemed to be important, the result of the congenital bands and membranes that were so common about the ascending colon and right half of the transverse colon. A large measure of relief could be given by freeing the colon as the result of a thorough removal of these bands, but he would not advocate wholesale operations on the neurasthenic, tired, thin young woman, usually suffering from an anxiety neurosis, who had a dependent caecum and comp a dragging or spasmodic pain when fatigued.

Passing to the difficult subject of post-operative lence and the more serious difficulties of mechan and paralytic ileus, Mr. Bryan said that the causes o these dangerous conditions were of importance because the surgeon should be able to do so much to avoid them. In the great majority there was an element of mechanical obstruction, and true paralytic ileus was very rare. He briefly mentioned the measures which seemed important to him in the treatment of post-operative paralytic ileus. These were: (1) rest and avoidance of stimulants; (2) continuous siphonage of duodenum by a tube passed through nose or mouth; (3) repeated administration of anti-gas-gangrene serum; (4) continuous application of heat to the abdomen; (5) administration of a spinal anaesthetic; (6) the giving of large quantities of fluid. Continuous intravenous methods were sometimes the best, but often the giving of large quantities of normal saline subcutaneously was the simplest and most practical means. The simplicity and value of this method and the large quantity of fluid that could easily be given were perhaps not generally realized. On the question whether morphine should or should not be used he had an open mind. He preferred to avoid it, because he thought it caused vomiting. Although it might not increase distension, it did tend to prolong it.

General Discussion

Sir ARTHUR HURST was surprised that Professor Cohen had not referred to the gall-bladder as one of the most common causes of so-called gastric flatulence. The individual with cholecystitis had an uncomfortable feeling in his epigastrium which he misinterpreted as due to the presence of gas. As there was no wind to bring it away he made futile efforts which manifested themselves in swallowing air. With regard to adhesions, he believed that these very rarely accounted for the chronic uncomfortable abdomen and flatulent dyspepsia. He had seen many patients who had had operations for adhesions and had never been the better for them. Only twice had he found it necessary to advise operation for diverticulitis. Even in severe cases where obstruction was present it was nearly always possible to overcome it by medical means and to keep a patient well afterwards. He did not agree with Professor Cohen's depreciatory remark about charcoal.

Dr. A. H. DOUTHWAITE spoke of the post-operative flatulence which was so troublesome to those who had undergone an abdominal operation. He believed that a good deal of it was due to the post-operative treatment. It was worse years ago when it was customary to purge these patients and starve them for twenty-four hours before operation. In certain cases patients, either owing to the advice of their surgeons or to their own obstinacy, refused to follow the usual practice of living on a fluid diet for a day or two after an abdominal operation, and took some solid food. These patients never stopped from having flatulence.

Mr. ZACHARY COPE said that one subject which had not been dealt with was the class of case in which extreme distension accompanied renal disease. This was not due to any of the causes Professor Cohen had outlined. He held that it was in some way a reflex phenomenon. The same was true of gall-bladder trouble. He had seen the most extreme distension with biliary pain without much peritonitis. He had sometimes been tempted to open the abdomen, thinking the large bowel was obstructed, and in one or two cases he had actually done so, but had found nothing except the gall-bladder disease, and perhaps some local inflammation, but no general inflammation. He thought it possible that here they were dealing with a reflex phenomenon of the large bowel.

Dr. MAURICE SHAW was rather disappointed that Professor Cohen, while stating that carminatives were useful

carbohydrate were calculated patients would exchange their foods much more easily, and accordingly Harrison and Lawrence extended this system, and in 1930 Lawrence and McCance re-analysed many foods and thought that certain fruits contained less carbohydrates than was supposed. Their investigation was continued by McCance and Widdowson, who repeated the work and found that the carbohydrate was more than had been thought. The changes made had been relatively slight, but he thought that a stable figure had now been reached. A large number of foods had been analysed, and patients had a considerable choice of foods and had no reason to complain of any restriction.

Nova et Vetera

BENEDICT ARNOLD, THE FIGHTING DRUGGIST

Commemoration of the 206th anniversary of George Washington's birth on February 22 recalls a striking personality with whom he was intimately associated at one period of his career. Benedict Arnold was born at Norwich, Connecticut, in 1741. Apprenticed to Donald and Joshua Lathrop, relatives of his mother, who owned the largest drugstore in the town and were also practising physicians, he picked up scraps of medicine and surgery. At the age of 21 he opened a shop of his own in New Haven, in those days a trading village of some five thousand inhabitants, having previously made several voyages to the West Indies and to London to buy drugs, books, and stationery. Over his store he put up the modest sign "B. Arnold, Druggist, Bookseller," with the motto "Sibi Totique." Business was successful from the first, and for thirteen years he was a leading and respected citizen of the community. At the outbreak of the American Revolution the "fighting druggist" left his shop for ever, organized a company of sixty volunteers, and started out for combat. His picturesque and heroic adventures have made his name almost as familiar in his country as that of Washington. One of his most celebrated feats is his march through the uninhabited Maine forests against Quebec, which for hardship and endurance is probably unparalleled in American history. At the Battle of Saratoga Arnold was the true hero, but Horatio Gates, apparently jealous of his fame, called him off the field, refusing to give him credit for a victory which marked the turning-point in the Revolution. This treatment embittered the proud and ambitious Arnold. And then Congress had promoted five junior officers over his head, in spite of Washington's protest. Next year we find him opening treasonable correspondence with Sir Henry Clinton, Commander-in-Chief of the British troops. Two years later he accepted the post at West Point with the intention of betraying this stronghold to the enemy. If he succeeded his reward was to be £20,000, and if he failed £10,000. Somehow the plot leaked out, and Arnold escaped to the British lines. He was appointed a Brigadier-General in the British Army and spent the remainder of his life in lonely and dishonoured exile in England and in Canada. He died in London in 1801. His story was told by William Abbatt in the *American Druggist*, 1900, **36**, 186, and his memory has recently been recalled by Clifford H. Rudes in the January number of the *Druggists' Forum*.

In 1838 Johannes Müller, teacher of Schleiden, Schwann, and Virchow, in his work "On the Finer Structure and Form of Morbid Tumours," established the cellular character of new growths. This landmark in the history of cancer has been commemorated by the New York Academy of Medicine, when Professor Howard W. Haggard read a paper entitled "The Conception of Cancer before and after Johannes Müller."

Reports of Societies

CAUSES AND TREATMENT OF FLATULENCE

At a meeting of the Medical Society of London on February 28, with Mr. J. E. H. ROBERTS in the chair, a discussion was held on the causes and treatment of flatulence.

Professor HENRY COHEN said that flatulence was one of the commonest of dyspeptic conditions, yet its mechanism was very little understood. Flatulence was a term often used by a patient in order to shield his own inability to describe his symptoms. Such symptoms as palpitation, nausea, constipation, headache, and cardiac pain were hidden in the usual complaint of flatulence. But "flatus" meant wind, and thus the essential symptoms must include wind or gas as an integral feature. There were five symptoms which might be complained of by a patient whose true complaint was flatulence. The first was belching or eructations; the second the passage of flatus per rectum in excessive amounts; the third a feeling of distension; the fourth gurgling or borborygmus; and the fifth pain or discomfort.

Flatulence could be defined as gas in the stomach or bowels, giving rise to discomforts which were relieved when the gas was expelled. The sources of gas in the alimentary tract were threefold: (1) swallowed air; (2) gas arising as a result of certain chemical changes; and (3)—a possibility, but not yet with certainty proved—the direct excretion of gases into the stomach and intestine from the blood stream. Four factors tended to modify the absorption of gas from the intestine. The first was the nature of the gas itself. Carbon dioxide was absorbed very rapidly, oxygen much more slowly, and nitrogen hardly at all. The first factor which tended to modify absorption, therefore, was the diffusion constant of the gas, and the second, the tendency of gas to combine with haemoglobin. The third factor was the diffusion of certain gases in the tissues themselves, and the fourth, the mucous membrane of the intestinal wall. If gases such as carbon dioxide and oxygen were absorbed into the blood stream, it was clear that any interference with the circulation in the gut would result in the accumulation of gases therein. This could be produced by any condition which caused venous stasis. Under normal conditions the amount of gas in the gut which was not absorbed was relatively small; its average composition was 10 per cent. carbon dioxide, 30 per cent. methane, and 60 per cent. nitrogen.

The Clinical Aspect

From the clinical standpoint flatulence might be divided into gastric and intestinal. Gastric flatulence was very largely the result of air-swallowing or aerophagy. Its most common symptom was a feeling of distension which was relieved by belching. Intestinal flatulence was much less commonly the result of aerophagy and much more commonly the result of fermentative processes. The division into gastric and intestinal flatulence was largely artificial, and it was far better to classify flatulence according to the mechanisms just described, although, of course, more than one mechanism might exist in any particular case. But the mechanisms described should enable certain types of flatulence to be recognized, and Professor Cohen considered each of five groups in turn.

The first of these was excessive air-swallowing or aerophagy. More air than usual might be swallowed because meals were hurried or mastication inadequate, or because there was excessive salivation, which last was responsible for the aerophagy in many post-operative conditions. Certain foods, such as omelettes and rusks, might, if taken quickly, carry more air into the stomach, and this was true of aerated water. But perhaps the commonest

cause of aerophagy was a different one. Any epigastric or substernal discomfort would almost certainly result in aerophagy as an attempted mechanism of relief. The trouble was that, like every habit spasm, it tended to go on after the cause had disappeared, and thus what was at first a purposive act became a tic. Having decided as to the mechanism, what was the obvious treatment? In the first place, the cause must be investigated with the greatest care. There were obvious causes like gastric ulcer or cancer, cancer of the oesophagus, and so on, but there were much less obvious causes, such as the early phase of angina pectoris, or some of the earlier manifestations of cirrhosis of the liver. To correct the deficiency, meals should be taken more leisurely, be relatively dry, salivation might be checked in certain cases by administering belladonna, and the rather sensitive nervous system treated by small doses of sedatives. What should not be done in aerophagy was to administer carminatives.

So much for aerophagy. Of the second group—delays and obstructions in the stomach and bowel—responsible for flatulence, these were very largely surgical conditions such as cicatricial stenosis in the stomach, giving rise to pyloric stenosis. A diverticulitis affecting the ascending colon was not an infrequent cause. Delay in the passage of food down the alimentary tract might be associated with spasm, and spastic colon was a cause of intestinal flatulence. It could also be associated with atony of the gut, and atonic constipation was again a not infrequent cause. The treatment of delays and obstructions must in the first place be directed towards the underlying lesion. The third group, consisting of fermentative activities in the gut, was a rather difficult field because so little was known of the subject. Two main types had been differentiated, one that of intestinal carbohydrate dyspepsia, and the other the cases occurring in intestinal affections in which there was excessive protein putrefaction. In the case of intestinal carbohydrate dyspepsia cereals should be avoided, also root vegetables, and in the protein forms of flatulence a lacto-vegetarian diet should be imposed. The fourth factor was a disturbance of the circulation in the intestinal wall. This was a factor not yet adequately assessed. The fifth factor was damage to the intestinal mucosa, not from toxins which arose in such diseases as typhoid and dysentery, but rather from poisons which one took optimistically and called purgatives and which undoubtedly irritated the mucous membrane of the stomach and intestine and promoted considerable interchange of gases and toxins which would not otherwise be allowed to pass through.

The treatment of any condition had not only to overcome the causes but to deal with symptoms. There were three main ways of dealing with symptoms: (1) the administration of carminatives; (2) the administration of absorbents such as charcoal and kaolin, neither of them a very effective remedy; and (3) particularly in post-operative flatulence, the passage of a tube for the removal of the gas.

Surgical Considerations

Mr. C. W. GORDON BRYAN thought there was a danger of being unduly impressed by the nervous or functional element in these cases and overlooking the organic causes of partial obstruction which could be removed by surgery. This applied especially to early or partial obstruction of the ascending or transverse colon where flatulence was commonly a permanent symptom. One problem in great need of solution was how best to treat cases of so-called visceroptosis of various types. In many of these cases the element of mechanical obstruction seemed to be important, the result of the congenital bands and membranes that were so common about the ascending colon and right half of the transverse colon. A large measure of relief could be given by freeing the colon as the result of a thorough removal of these bands, but he would not advocate wholesale operations on the neurasthenic, tired, thin young woman, usually suffering from an anxiety neurosis, who had a dependent caecum and complained of a dragging or spasmodic pain when fatigued.

Passing to the difficult subject of post-operative flatulence and the more serious difficulties of mechanical and paralytic ileus, Mr. Bryan said that the causes of these dangerous conditions were of importance because the surgeon should be able to do so much to avoid them. In the great majority there was an element of mechanical obstruction, and true paralytic ileus was very rare. He briefly mentioned the measures which seemed important to him in the treatment of post-operative paralytic ileus. These were: (1) rest and avoidance of stimulants; (2) continuous siphonage of duodenum by a tube passed through nose or mouth; (3) repeated administration of anti-gas-gangrene serum; (4) continuous application of heat to the abdomen; (5) administration of a spinal anaesthetic; (6) the giving of large quantities of fluid. Continuous intravenous methods were sometimes the best, but often the giving of large quantities of normal saline subcutaneously was the simplest and most practical means. The simplicity and value of this method and the large quantity of fluid that could easily be given were perhaps not generally realized. On the question whether morphine should or should not be used he had an open mind. He preferred to avoid it, because he thought it caused vomiting. Although it might not increase distension, it did tend to prolong it.

General Discussion

Sir ARTHUR HURST was surprised that Professor Cohen had not referred to the gall-bladder as one of the most common causes of so-called gastric flatulence. The individual with cholecystitis had an uncomfortable feeling in his epigastrium which he misinterpreted as due to the presence of gas. As there was no wind to bring it away he made futile efforts which manifested themselves in swallowing air. With regard to adhesions, he believed that these very rarely accounted for the chronic uncomfortable abdomen and flatulent dyspepsia. He had seen many patients who had had operations for adhesions and had never been the better for them. Only twice had he found it necessary to advise operation for diverticulitis. Even in severe cases where obstruction was present it was nearly always possible to overcome it by medical means and to keep a patient well afterwards. He did not agree with Professor Cohen's depreciatory remark about charcoal.

Dr. A. H. DOUTHWAITE spoke of the post-operative flatulence which was so troublesome to those who had undergone an abdominal operation. He believed that a good deal of it was due to the post-operative treatment. It was worse years ago when it was customary to purge these patients and starve them for twenty-four hours before operation. In certain cases patients, either owing to the advice of their surgeons or to their own obstinacy, refused to follow the usual practice of living on a fluid diet for a day or two after an abdominal operation, and took some solid food. These patients never stopped from having flatulence.

Mr. ZACHARY COPE said that one subject which had not been dealt with was the class of case in which extreme distension accompanied renal disease. This was not due to any of the causes Professor Cohen had outlined. He held that it was in some way a reflex phenomenon. The same was true of gall-bladder trouble. He had seen the most extreme distension with biliary pain without much peritonitis. He had sometimes been tempted to open the abdomen, thinking the large bowel was obstructed, and in one or two cases he had actually done so, but had found nothing except the gall-bladder disease, and perhaps some local inflammation, but no general inflammation. He thought it possible that here they were dealing with a reflex phenomenon of the large bowel.

Dr. MAURICE SHAW was rather disappointed that Professor Cohen, while stating that carminatives were useful

in intestinal flatulence, did not attach much value to them in gastric flatulence. His own experience suggested to him that, for some reason which he could not explain, they were of use in that condition. He did not agree with Sir Arthur Hurst's praise of charcoal for the relief of flatulence. Dr. T. JENNER HOSKIN pointed out the importance of flatulence in heart trouble. One could say that it was like the trigger in angina pectoris. He had seen many cases in which flatulence had been the cause of acute pulmonary oedema and paroxysmal tachycardia. In fact, he always felt that in the management of heart cases the treatment of flatulence was almost the main consideration. He also stressed the importance of a strict diet. The PRESIDENT spoke of the importance of giving patients who had undergone an abdominal operation a light, easily digested diet. He alluded to one cause of painful flatulence—namely, a troublesome spastic colon.

Professor COHEN, in reply, said that he would not like to claim that prostigmin or acetylcholine, of which he had little experience, or pituitrin, of which he had some experience, was of no value in paralytic ileus, but they must be used with some consideration, and regard must be paid to treatment by fluids and also the administration of chlorides. There was great loss of chlorides in many of these cases of paralytic ileus and they required replacement by rather more than the normal amount of chloride in normal saline. With regard to flatulence accompanying cholecystitis, he thought there were three factors which played a part, if not the whole part, in the flatulence of gall-bladder disease. The first was aerophagy, the second was the muscle tension which accompanied the gas content of the stomach, and the third—a factor commonly overlooked—was an associated chronic hepatitis. He hoped he had not said that gastric carminatives were of no value whatever. What he had said was that they should not be used in simple cases of aerophagy. He thought they had a certain value in some cases of gastric flatulence.

MASSIVE COLLAPSE OF THE LUNG

At a combined meeting of the Sections of Surgery, Medicine, and Anaesthetics of the Royal Society of Medicine on March 2, Professor GREY TURNER presiding, the subject of discussion was massive collapse of the lung as a complication of surgical operations. There was such a large attendance that in the middle of the meeting the audience had to proceed to a bigger hall.

Underlying Factors

Mr. C. PRICE THOMAS said that it was a moot point whether bronchial occlusion was the only cause of atelectasis. It explained perhaps 98 per cent. of the cases, but others were difficult to explain on that ground. Patients were occasionally seen in whom atelectasis occurred suddenly, and this could not be the result of occlusion as there was not sufficient time for the absorption of the contained air. Some hours must ordinarily elapse before atelectasis was produced, and the explanation of a neuromuscular basis would have to be brought in to account for this group of cases. If it was accepted that massive collapse was the result of bronchial occlusion, then a review of the incidence of the condition was timely. The two factors concerned were the presence of secretion and the patient's inability to expel it. The secretion was characteristically thick and tenacious, and its mechanical dislodgment by suction tube needed a fairly strong pump. He did not believe that the type of anaesthesia employed played any great part in the production of the condition. The type of operation was much more important. It was after abdominal operations that most of the cases occurred, and after upper abdominal operations more frequently than after lower, except that appendicectomy with drainage or an operation for appendix abscess also showed a rate of production of massive lung collapse which approximated to that of the upper abdominal type. Sepsis had been suggested as the cause of this condition, but it was doubtful whether sepsis *per se* had any influence on its genesis; more probably the consequent post-operative rigidity was the chief factor.

Rival Theories

Dr. JAMES MAXWELL said that the impression had been given that there were two schools of thought with regard to the production of massive collapse—one which emphasized diaphragmatic paralysis and the other bronchial occlusion. There was no doubt that bronchial occlusion was the cause of spontaneous massive collapse, but did this mean that the original thesis was necessarily entirely wrong? It seemed to him that these two views could be reconciled, and that a real understanding could then be reached of spontaneous post-operative massive collapse. Why did that block of muco-pus accumulate in certain circumstances? It seemed to him that if a local factor, a weakness of the diaphragm, were postulated, an answer was given to the question why such accumulation was localized in a given area. The two views were not opposed to each other; in his belief there was a great deal in the theory of diaphragmatic weakness causing the localization of a block of muco-pus in the bronchus. He emphasized the great importance of the cough reflex in keeping the respiratory tract clear. In man the cough was a natural means of clearance, and he did not think that some people realized how much damage was being done to the patient if for any reason they discouraged the cough reflex. He knew that the surgeon did not like the patient to cough because it meant that he might burst his stitches, but it might be wiser to put in stronger stitches.

The group of factors responsible for massive collapse were as follows: (1) debility, either local or general; (2) the state of the bronchial passages from the point of view, first, of a tendency to bronchitis, and, secondly, of a tendency to asthma; (3) pre-operative and post-operative medication. On this last point he mentioned that morphine was a very noxious drug in this connexion; it was perhaps the most potent respiratory depressant known. One had only to take a semi-conscious patient and give him a dose of morphine to see the great slowing down of the respiratory movement that followed. The patients who were given generous doses of morphine before and immediately following operation were being placed in exactly those conditions which predisposed to spontaneous post-operative massive collapse.

The Clinical Picture

Dr. Maxwell then turned to the clinical picture. The symptoms were extremely like those of pneumonia. One misleading symptom was acute pain in the chest; it varied with respiration, was worse on inspiration, and simulated exactly the pain of acute pleurisy, but it was not due to acute pleurisy. It was most likely the result of a sudden increase in the negative tension in the pleural space. Dyspnoea was not a very frequent event unless the whole lung was involved. These patients were frequently very ill, and it was always difficult to disentangle that part of their illness which was due to their recent operation from that part which was due to the chest complication. There was often a temperature from the damming-up of a certain amount of infected material distal to the block of muco-pus. The first physical sign of the development of massive collapse of a lobe was a weakening of the breath sounds at the base. The percussion note was impaired, sometimes so much impaired as to suggest fluid. When the mediastinum was displaced at all it was displaced towards the side of the lesion. There were two complications—and it was because of the complications rather than of the condition itself that massive collapse was so important—namely, pulmonary suppuration and the subsequent development of bronchiectasis. It was astonishing how rapidly bronchiectasis could develop. It was not a very

frequent complication, but it was important when it happened.

Treatment he would divide into three stages, including as the first line of treatment the prevention of the development of the condition altogether. The patient should not be given excessive doses of morphine; the absolute minimum should be used both before and after operation. Any drug that was likely to interfere with the respiratory movements was better omitted. In addition to that, every effort should be made, at least in patients whose operation was not an emergency one, to see that their respiratory apparatus was in the best possible shape. It might be necessary to institute breathing exercises and general massage and movement. It was in the early stage that the inhalation of carbon dioxide gas was of particular value; in a later stage, when the bronchus was already obstructed and the condition established, it was a waste of time to give carbon dioxide. Unfortunately he did not know of any medicine that would help the patient to expel the block, but anything which made him cough and so assisted self-expulsion should be given. If he could not expel it himself the only thing to do was to expel it for him, and in that event bronchoscopy was required. He was entirely against bronchoscopy as a routine at the earliest stage, nor did he think more than one bronchoscopy necessary as a rule. When suppuration supervened it was in the form of either lung abscess or bronchiectasis. Postural treatment for most of these patients was out of the question. It was well to wait, encouraging the patient to cough up as much as possible, until the abdominal scar was safely healed, and then the bronchiectasis or the lung abscess could be treated on its merits.

Role of the Anaesthetic

Dr. E. H. RINK suggested that the term "massive collapse" should be restricted to the severest cases, and the terms "lobar" and "lobular atelectasis" be substituted for others. He believed that the anaesthetic in itself had very little to do with the primary condition of atelectasis. On the average he found that the proportion of chest complications after abdominal operations, including those for hernia, was about 14 per cent., while that for non-abdominal operations was about 1 per cent. It was natural to suppose that irritant inhalation anaesthetics would be a factor, and it was true that ether or any other anaesthetic if unskilfully administered would do harm. But there was no evidence that ether when perfectly administered played any important part in the production of atelectasis. At his hospital many hundreds of tonsillectomies had been performed under pure ether and oxygen anaesthesia, and there had not been a single case of post-operative atelectasis. At the same time, it was only common sense not to administer ether, unless unavoidable, to a bronchitic patient for an upper abdominal operation. Ever since the nature of this complication had been realized efforts had been made to avoid it, usually by the adoption of some single measure, such as the avoidance of all inhalation anaesthetics or the giving of large doses of atropine, for all cases. All these single measures were doomed to failure because the causation of atelectasis was multiple.

Atelectasis was commoner in men than in women in the proportion of about three to one. There were two reasons for this, one being that bronchitis was commoner in men than in women, and the other that men breathed primarily with their diaphragm and women primarily with their thorax. No age was exempt. Some severe cases occurred in children, but the frequency of chest conditions increased with increasing age. He believed that in every case of atelectasis careful inquiry into the history would show evidence either of chronic bronchitis or of something like the tail-end of the common cold. The consistency with which purulent or muco-purulent sputum was produced in these cases made it impossible for him to believe other than that the infection was already present latent before the operation. With regard to pre-operative measures, breathing exercises for a week before an abdominal operation might be of great benefit. Provided the condition of the patient would warrant it, in bad cases requiring abdominal operations spinal or local anaesthetics should be used.

General Discussion

Dr. HORACE JOULES described two cases which had been under his care during the last twelve months in which the atelectasis had been due to paralysis of the phrenic nerve following mediastinal pleurisy and a paralysis of the diaphragm. Dr. RANYARD WEST mentioned certain work on animals in connexion with the acute collapse which took place in curarine poisoning. Curarine, an active alkaloid of curare, could produce sudden collapse of the lung without any warning, and the post-mortem finding was one of complete general collapse. He drew attention by means of a diagram to certain similarities between the action of ether on respiration and of curarine.

Dr. LEONARD FINDLAY, remarking that he had had a considerable experience of spontaneous collapse in children, said that previous speakers had advanced no definite cause for post-operative collapse, but had brought in a multiplicity of factors. Therefore the causation of spontaneous collapse might have some relevance. The radiological picture in the average example of post-operative collapse was very different from that in the average case of spontaneous collapse. The sharp margin seen in spontaneous collapse was not observed in the other. If inquiry were made into the history of these cases of spontaneous collapse one would learn that a most inveterate cough was the initial symptom. That being so, he could not understand how it was said to be due to an obstruction. If some material getting into the bronchus was the cause, surely the complication would be most frequent after operations on the nose and throat, and yet there it was at its rarest. It occurred nearly always only after abdominal operation.

Mr. J. B. HUNTER said that it was not realized how greatly anaesthetic practice had changed. Some of them would remember the time when open ether was employed extensively. Atropine then came into use and had been used ever since, irrespective of the fact that now anaesthesia had altered, and in a very large number of cases gas and oxygen with a basal narcotic were employed. When an ether anaesthetic was employed an enormous amount of secretion was produced, and if atropine were used the type of secretion was so tenacious that it could only be likened to the material round an old seccotine tube which had been long exposed to air. It was impossible to move it save by mechanical means. Personally he had entirely given up atropine in any case in which he had employed gas and oxygen with a basal narcotic, and he had been extremely impressed by the improvement which had taken place in thyroid surgery as a result. Dr. Maxwell was a little out of touch with modern surgery if he thought the surgeon was frightened of his wound bursting. He wanted a deep anaesthesia not for that reason, but because it enabled him to handle the patient gently.

Dr. H. LETHEBY TIDY said that he believed there were two factors: first, secretion in the bronchial tree, and, secondly, muscular weakness. Either of these might produce massive collapse of the lung; generally they acted together. The physics of the lung were so difficult that nobody had yet been able to propound a theory which included all the factors. The action of the diaphragm in particular had been neglected.

Professor G. GREY TURNER, from the chair, said that he was one of those who was extremely grateful to the anaesthetists of to-day, but he was still distressed over the calamities which occasionally occurred, such as they had been discussing that evening. He felt that a number of the troubles from which they suffered were due to the half-dead condition of the patients. He thought that pre-medication had gone much too far. In the old days when patients vomited and coughed and were very uncomfortable after operation their ultimate recovery was much more complete. There was certainly a tendency to the abuse of morphine and other sedatives. He thought it also important that patients should be adequately bandaged after operation. It had become the fashion in many clinics to dispense with bandages and to be content with strapping fixed on the dressing, but that made the patient anxious to suppress his desire to cough; he ought to be encouraged to cough, and even aided mechanically to do so. He thought it a pernicious practice for patients—

speaking, of course, of non-emergency operations—to be taken on to the operating table straight off the street, as it were. It was wrong to put off entering the hospital or nursing home until the very last moment, and to expect a considerable operation to be carried out next day. Also—it was perhaps heresy to say so—he could not help going back regretfully to the old days of skilfully given chloroform anaesthesia, for he remembered so well what wonderful recoveries were achieved.

PRURITUS VULVAE

A discussion on pruritus, with special reference to pruritus vulvae, was opened by Dr. R. M. B. MACKENNA and Miss R. NICHOLSON, at a meeting of the Liverpool Medical Institution on February 17, with the president, Dr. E. GILBERT BARK, in the chair.

Dr. MacKenna emphasized the importance of recognizing the condition known as lichenification when dealing with cases of localized pruritus, and summarized the possibilities of treatment by internal remedies, local applications, and psychological methods. Unless an attempt was made to determine the cause of the pruritus in any given case, treatment of the symptom itself was of little avail. Miss Nicholson remarked on the necessity of local examination and of a search for the cause before the treatment of any case of pruritus vulvae was begun. Smegma round the clitoris and nymphae, uncleanliness, pediculi, and threadworms were simple causes and easily dealt with. Vaginal discharges due to endocervicitis might be treated by pessaries, by ionization, and by diathermy of the cervix. The *Trichomonas vaginalis* might also be responsible for pruritus. Abnormal conditions of the urine, including glycosuria, hyperacidity, and oxaluria, were mentioned, and the escape of urine in cases of prolapse or vesico-vaginal fistula, and in later years even poor sphincter control alone causing leakage of a few drops of urine after micturition. Careful drying and sponging after micturition was recommended. Irritation during pregnancy was relieved by alkaline baths and calcium internally. The view of Swift of Australia was that achlorhydria, causing a lack of absorption of vitamin A, was an aetiological factor in this condition, and he advised treatment by the oral administration of dilute hydrochloric acid and vitamin A.

In the discussion which followed Dr. ISABELLA BUTLER spoke on the treatment by electrical methods of pruritus associated with leucorrhoea due to a chronic cervicitis. Diathermy or ionization of the cervix, high-frequency treatment, small doses of *x* rays to the vulva, and ultra-short-wave therapy using Schliephake's vaginal electrode were possible methods of treatment. Mr. PERCY MALPAS said that the greatest problem in practice was the treatment of those cases of pruritus vulvae for which no local cause could be found. Trichomonas infection should be suspected even if there was little or no vaginal discharge, and especially when the symptoms caused by leucorrhoea were out of all proportion to the apparent severity of the discharge. A useful practice was to restrict the amount of sugar in the diet; many patients exhibited a transient glycosuria, usually due to excessive tea-drinking, which might not always be detected at the time of examination. Injections of A.B.A. were not as successful in the treatment of pruritus vulvae as in pruritus ani. As a local dressing the use of drying powders such as talcum might have received more attention. Sympathectomy was inadvisable, but good results had been seen in very severe cases after division of the pudic nerves in Alcock's canal, the only disadvantage of this procedure being the resultant anaesthesia.

Mr. T. N. A. JEFFCOATE said that the administration of oestrogenic hormones was called for only when there was evidence that the pruritus was caused by an atrophic condition of the vulva and vagina; large doses, preferably of the benzoate preparations, were usually required and the results were excellent. Oestrogenic compounds rarely helped those patients in whom there was no evidence of an underlying ovarian deficiency. Local division of sensory nerves was a useful means of dealing with intractable pruritus of unknown origin. Dr. R. W. BROOKFIELD commented on the influence of vasoconstrictor drugs on generalized pruritus. Ephedrine and adrenaline frequently afforded relief in the itching of urticaria, and he had found that the intolerable pruritus associated with the severer forms of serum sickness, though it might not respond to adrenaline, was relieved in dramatic fashion by the injection of pituitrin. The same result had been observed in the itching of chronic jaundice.

Cardiac Failure

At the same meeting Dr. G. RONALD ELLIS read a short paper on cardiac failure.

Dr. Ellis said that the fundamental problem in cardiovascular pathology was concerned with the immediate cause of the majority of cases of heart failure. Why did the patient with old-standing symptomless aortic regurgitation suddenly develop symptoms of heart failure, when it was known that the valvular lesion had undergone no change for many years? After discussing those instances, as in massive infarction, in which the anatomical findings did seem adequately to explain the cardiac insufficiency, Dr. Ellis described the microscopical changes in the myocardium, and pointed out that for the most part they did not explain the sudden failure. The explanation was probably to be sought in some metabolic change in the heart muscle akin to fatigue in skeletal muscle. In the young person with pneumonia whose heart was healthy primary failure probably never occurred, the circulatory failure being peripheral in type, and symptomatic really of "shock."

In the discussion which followed Professor JOHN HAY referred to the causes of failure in hearts already affected by prolonged strain. The precipitating factor was usually the onset of auricular fibrillation, some toxic process such as influenza, or a defective supply of oxygen to the myocardium, caused by anaemia or a narrowing of the orifice of a coronary artery. Coronary occlusion in late middle life was another factor which had to be borne in mind. Dr. A. J. MCCALL said that myocardial damage due to syphilis was usually attributed to occlusion of the coronary orifices by syphilitic aortitis. A diffuse gummatous infiltration of the myocardium was sometimes found, and, as emphasized by Warthin, might be more common than was generally supposed. Jaundice appearing suddenly in a patient with congestive cardiac failure was frequently attributable to pulmonary infarction. A case of myxoedema with severe angina pectoris was described; both conditions responded to thyroid therapy.

PORADENITIS VENEREA

At a meeting of the Royal Society of Tropical Medicine and Hygiene at Manson House on February 17, with the president, Lieutenant-Colonel S. P. JAMES, in the chair, a discussion on "climatic bubo or lymphogranuloma inguinale" was opened by Dr. H. M. HANSCHELL.

Dr. Hanschell reviewed the 130 cases, all male, seen at the Royal Albert Dock Hospital during the last eighteen years. He expressed his indebtedness to Dr. Marshall Findlay, who had carried out animal inoculations for him, and to Dr. H. S. Stannus, "whose scholarly researches had opened a window on the full extent of this infection." The cases had been studied against a background of nearly 18,000 men with lesions of the genital and inguinal areas, including gonorrhoea, attending the venereal diseases clinic in the same period. All the cases had been infected in the Tropics or sub-Tropics; in eighteen years he had detected no case infected in this country. The condition was strictly a venereal disease of the male and of the Tropics,

and consisted of a tedious but rather trivial illness confined to a more or less suppurative inguinal adenitis, though this was, in fact, less than half the disease. The primary papulo-herpetiform lesion on the penis appeared three to five days after coitus, and vanished, leaving no trace, in eight days. Some swelling in the groin was noticed by the patient seven to twenty-one days after coitus. No known drug had any effect on the bubo. Rest in bed was the main treatment, aided by the intravenous injection of T.A.B. vaccine. Operation was resorted to in about 15 per cent. of the cases. The male was an inefficient transmitter of the disease: for it to take root in this country infected women, or more of them, would have to be imported. The Frei intradermal test was helpful in diagnosis, especially with a pooled antigen prepared for him by Mr. A. H. Walters from glands in which Dr. Findlay had shown the presence of active virus by animal inoculation. Dr. Hanschell described certain lesions in the rectum of a male patient suffering from proctitis who gave a repeated positive Frei test with the pooled antigen. This was perhaps a direct early infection of the rectal mucosa with the virus, due to sodomy (confessed) while abroad. He concluded by saying that the names "climatic bubo" and "lymphogranuloma inguinale" should be scrapped, and "poradenitis venerea" adopted, as suggested by Dr. Stannus.

Dr. C. C. CHESTERMAN described what he termed poradenolymphitis as it occurred in male and female native patients at the hospital of the Baptist Missionary Society, Yakusu, near Stanleyville, in the Belgian Congo. He agreed as to the remarkable specificity of Frei's intradermal test, and stated that where that and the Demelcos test for chancroid were negative strong presumptive evidence of syphilis was afforded in doubtful cases of genital sore accompanied by inguinal bubo. In males the typical puckered groin scar with fistulous openings was often observed, together with involvement of the scrotum. In women, mostly of the prostitute class, four points were stressed. First, the rarity of inguinal adenopathy, which was noticed only in one case in ten when the primary sore was on the fourchette; it subsided without the formation of fistulae. Secondly, the frequent development later on of rectal stricture—in five cases out of six in which the infection had lasted two or more years. In Dr. Chesterman's opinion this was a natural extension of the disease and was not due to rectal coitus, because there seemed no evidence nor motive for this practice in that district, and also, as Dr. Hanschell had pointed out, rectal infection was unlikely on account of the short period of infectivity in the male. Rectal stricture occurred between 5 and 9 cm. from the anal orifice, and was generally accompanied by ulceration, a foul discharge, and the passage of ribbon-shaped blood-stained faeces; not infrequently fistulae were found. A third point was that ano-vaginal fistula was noted in three cases, but all attempts at surgical closure failed. Lastly, the primary lesion, commonly on the labia minora or vestibule, tended to persist as a chronic ulcer; the mucous surfaces involved became indurated with tags and perforations, and the skin-covered tissues became elephantoid.

Experimental Investigation

Dr. G. M. FINDLAY said that as a result of experimental investigation it was now realized that lymphogranuloma inguinale (poradenitis venerea) was a generalized disease, and in addition to such lesions as a primary sore with inguinal bubo, proctitis, stricture of the rectum and vagina, and elephantiasis of the penis, scrotum, or vulva, there had been noted in man conjunctivitis, arthritis, skin rashes, and meningitis. Experimentally the disease could be conveyed to monkeys other than rhesus monkeys, mice, guinea-pigs, cats, and dogs by intracerebral injection, which caused a fatal meningitis. In guinea-pigs and dogs inguinal buboes could be produced by injection into the groin, while injection into the prepuce in monkeys led to inguinal adenitis; the virus could also pass through the scarified skin. It travelled almost entirely by the lymphatics, and the essential lesion was a reaction of the mesodermal elements in the lymph channels, which become blocked with large mononuclear cells, plasma cells, and lymphocytes with the formation of characteristic nodules in the meninges or meningeal septa of the brain. There was considerable evidence to suggest that the actual virus agents were small granules of the same dimensions as the vaccinia virus. These granules were found in the pus from inguinal buboes, in experimental lesions in animals, and in the chorio-allantoic membrane of the developing chick embryo which had been infected with virus-containing material. The most satisfactory diagnostic method was the isolation of the virus by intracerebral injection of suspected material into monkeys or mice. In addition a number of immunological tests had been employed, of which the best-known was the Frei test, which appeared to depend on the presence of killed elementary bodies in the material injected. It was thus comparable with the allergic reaction following the injection of the killed elementary bodies of vaccinia. Another test, proposed by Wassén, consisted in the injection of a mixture of virus and serum intradermally into guinea-pigs. When the serum contained immune bodies no reaction occurred, but if immune bodies were not present a small papule appeared and broke down to form an ulcer in about forty-eight hours. The intravenous injection of Frei antigen in man was also said to give rise to a febrile reaction if the persons were infected with the virus of lymphogranuloma inguinale, while in normal persons no reaction occurred.

Local News

SCOTLAND

Psychiatric Treatment in Scotland

At a meeting on February 18 of the Edinburgh Women Citizens' Association Dr. David Yellowlees, medical director of the Lansdowne Clinic for Functional Nervous Disorders in Glasgow, said that psychological factors had not been sufficiently allowed for by the law in its treatment of delinquents and criminals. Some people would like to say that mental disease was the one and only cause of delinquency, but the condition was not so simple, for it was too sweeping to assert that no delinquent was mentally normal. It was true to say, however, that no delinquent was as fully developed mentally as he might be. Some delinquents suffered from mental defect, some from a psychoneurotic condition, and a small number from actual insanity. Emotional instability was also a factor. The neurotic group of delinquents suffered not from any inherent defect, intellectual or moral, but from a lack of balance. He thought there would always be need for laws and penalties, although more discrimination was necessary; if a citizen was normal enough to enjoy a citizen's privileges he was normal enough to take a citizen's responsibility.

Dr. G. L. Linklater, school medical officer, Edinburgh, lecturing to the same association on February 22, dealt with exceptional children and their needs. Many children who were called dull, he said, were merely the subjects of mental inertia and took longer to bestir themselves mentally, while many who were regarded as bright, particularly because of verbal fluency, had no depth of intelligence. Too often, however, the apparently dull child who was subject to scorn became self-doubting and soured. The brilliant child was apt to be praised and to develop a self-esteem which was unwarranted, so that he came to be found out, and, with his disillusionment, developed a reaction against society. The prevention of these extremes of estimation lay in testing children for intelligence so that their education could be planned on lines suited to

capacity and speed. Under-nourishment was an important factor, which, however, was less prevalent among school children to-day than ever before; the pre-school child, however, had not improved in this respect as he ought to have done. The city of Edinburgh proposed to build a unit in country surroundings where there would be provision for a limited number of children who might be termed pre-delinquents or children who under the observation of the teaching staff showed "difficult" tendencies. These children required a change of environment, detailed observation, and treatment. Children who were subject to fear had frequently been too much shielded and had not developed the courage and experience necessary to face the world; they needed to be encouraged to mix on terms of equality with their fellows.

Central Midwives Board

At a meeting of the Central Midwives Board for Scotland Professor R. W. Johnstone and Professor James Hendry were elected chairman and deputy chairman respectively for the ensuing year. The Board appointed examiners and approved, subject to inspection, the list of recognized training institutions, with their teachers, for the training of pupil midwives.

Professor of Dentistry at St. Andrews

A chair of dentistry at St. Andrews University was recently established by a gift of £17,500 from Mr. William Boyd of Dundee, who is chairman of Dundee Dental Hospital, and the University Court has appointed Dr. H. Gordon Campbell, dental surgeon of Dundee, to be the first occupant. Dr. Campbell, who qualified in medicine L.R.C.P. and L.R.C.S., Edinburgh, in 1904, has been lecturer on dental anatomy in the Dundee Dental School and dental officer to the Dundee School Board since 1913. He has done a considerable amount of organizing work in connexion with dental surgery, having been secretary of the Dundee Military Dental Service, which was the first of its kind in the country at the outbreak of the war. He also organized the Dundee Dental Health Association, through which Dundee dental surgeons have given addresses to the public on the importance of the care of the teeth and mouth.

Inquiry into Physical Welfare

It was stated at the annual meeting at Dunfermline on March 4 of the Carnegie United Kingdom Trust that the trustees had set aside a sum of £10,000 to meet the cost of an inquiry into the connexion between the economic and social factors influencing physical welfare. The inquiry will be under the direction of Sir John Orr of the Rowett Research Institute, Aberdeen. It was also stated that in the allocation for 1936–40 a sum of £150,000 had been set aside for land settlement development and that up to the end of last year £68,000 had been paid in grants to the land settlement association. The general purpose of this association is to test the possibility of creating a new opportunity of earning a healthy, happy, and prosperous livelihood by cultivation of the soil and breeding of stock for men in the special areas whose chance of employment has ceased. This association now controls twenty-five estates, comprising 11,000 acres and providing for the establishment on small holdings of about 7,000 persons from the special areas.

District Nursing

The annual report of the Scottish Council of the Queen's Institute of District Nursing for 1937 shows that in the previous year out of the registered births in Scotland numbering 88,928 Queen's nurses attended 14,612, or approximately one-sixth of the whole number. Of these, 2,467 cases were attended by the nurses acting as midwives, and the remaining 12,145 cases by nurses acting under the direction of a medical practitioner. The maternal mortality among cases attended by the Queen's nurses was 3.6 per 1,000 births, while in the other cases in Scotland the rate was 5.9 per 1,000 births. In view of the increase in salaries of Queen's nurses in England the Scottish Council also decided to make an increase, the nurses in Scotland being put from January 1 last on a scale commencing at £75 rising to £100 per annum for those undertaking maternity nursing, in addition to allowances for board and uniform.

ENGLAND AND WALES

Welsh Board of Health: New Headquarters

On March 1 the Minister of Health, Sir Kingsley Wood, opened the new headquarters of the Welsh Board of Health in Cathays Park, Cardiff. He recalled that the department had its origin in the National Insurance Act, 1911, which was conceived in the fertile mind of one of the greatest of all Welshmen, Mr. Lloyd George. Under the Welsh Board of Health 900,000 working-class people in Wales received medical attention and treatment, 1,000,000 people contributed to the pensions scheme, and 200,000 now received pension allowances. The building would be devoted to war against disease and ill-health, particularly in the interests of two great causes—care of the mother and child and welfare of the blind. Mr. Arthur Greenwood, M.P., a former Minister of Health, said he hoped the building would not only be the latest embodiment of the Welsh spirit of nationality but would become a power-house radiating its influence into the homes of the humble folk in Wales.

Medical Society of London

The Medical Society of London held its 163rd anniversary dinner on March 1, with the president, Mr. J. E. H. Roberts, in the chair. After the loyal toasts had been honoured the health of the Society was proposed by Mr. R. H. Bernays, Parliamentary Secretary to the Ministry of Health, who began by saying: "We politicians have to face up to our results; you can put your results underground." The Medical Society of London, he continued, was the oldest in the country and had helped to advance knowledge in both medicine and surgery. It had also played an important part in preventive medicine, "which means 'Consult your doctor, and consult him in time.'" Lettsom, the founder of the Society, had interested himself in such matters as ventilation and dietetics, and in 1798 had published a tract entitled "Hints respecting the Effects of Hard Drinking." Among other past presidents of the Society Mr. Bernays referred to Dr. John Snow, who had removed the Broad Street pump handle in the cholera outbreak, and to Sir Benjamin Ward Richardson, who had coined the phrase, "National health is national wealth"—which every Minister of Health had since produced as a brilliant impromptu. Mr. Bernays ended a witty speech by making a plea for co-operation between the voluntary and municipal medical services. In responding, Mr. Roberts said that the finances of the Society were on a satisfactory footing, that its meetings had never been better attended, and that the number of Fellows was higher than it ever had been. The Society had recently been presented by Colonel Clutterbuck with a Fothergillian medal and a set of bleeding instruments which had belonged to his forebear, Dr. Henry Clutterbuck, who was president of the Society in 1819. In the early days the Society used to meet in private houses and taverns in the city, until in 1788 it acquired a house of its own. In 1850 the Society moved to George Street, Hanover Square, and in 1871 they acquired the lease of their present house in Chandos Street, which was now, however, no longer modern and too small for their needs. In four years' time certain leases would fall and the question of a building for the Society would then become urgent. The health of the guests was proposed by Mr. Alex. E. Roche, who welcomed each guest in turn with a short and apt biographical

reference. Among them was a great-great-grandson of Lettsom, Mr. Hugh Elliot. Mr. H. L. Eason replied in a characteristically humorous speech, in which he referred to the "inferiority of Guy's men in the presence of men from Bart's." Mr. Elliot in a few remarks recalled the description his grandfather had given him of Lettsom's funeral.

District Nursing in London

The annual meeting of the Central Council for District Nursing in London was held at the County Hall on February 24 with Sir William J. Collins in the chair. The twenty-third annual report, which was adopted, stated that the council had again received from the trustees of the London parochial charities a grant of £4,000, which sum, together with £400 from the funds of the council, had been distributed to seventy-four district nursing associations in affiliation. During the year the council had also distributed £7,575 contributed by the London County Council in aid of the public assistance work performed by district nursing associations. It was mentioned that the home nursing of persons coming within the scope of public assistance had continued smoothly. The cases visited for general nursing and for administering insulin to diabetic patients had numbered between 1,200 and 1,400 each quarter, and the number of visits each quarter about 50,000. The visits for insulin administration were paid for by the L.C.C. at the fixed rate of 6d. per visit. The grant for general nursing worked out at between 9.7d. and 11.3d. per visit. The central council during the year awarded six bursaries to enable district nurses to take courses in midwifery and maternity work, and fourteen bursaries to enable nurses practising midwifery to study the administration of analgesics. A recommendation was proposed to the meeting from the executive committee, and agreed to, that in view of the increased cost of district nursing and of the inadequacy of the present grants from local authorities it is desirable that payments by borough councils for nursing services under statutory powers be made upon the basis of a consolidated subscription rather than upon a per visit basis. The constituent nursing associations are being asked to take up this question with their respective borough councils. It was stated that the London County Council had already had some discussion with the borough councils in regard to the nursing of maternity complications and the possibility of payment by the borough councils by block grants based on statistics for the past three years. The executive committee was re-elected, one new medical member being added in the person of Dr. P. B. Spurgin, who was proposed by Dr. W. Paterson and seconded by Sir Comyns Berkeley, and the finance committee, with Sir Stanley Woodwark as the medical member, was also reappointed.

Guy's Hospital Dental School

Guy's Hospital Dental School celebrated its forty-ninth anniversary on March 5 by an annual clinical meeting, and between 400 and 500 past students returned to renew old acquaintance and to witness demonstrations of modern procedures by members of the present staff. The school presented a busy and crowded appearance throughout the day. Operations of dental interest proceeded in the two theatres, demonstrations of anaesthesia in the general anaesthetic room, pathological specimens were shown in the dental research laboratory, and clinical cases in the conservation department. In the children's department orthodontic cases were shown, prosthetic cases in the denture room, and an exhibition of students' work in the prosthetic laboratory. At a luncheon presided over by the dean of the dental school (Mr. T. J. Evans) it was mentioned that Guy's is the largest dental school of the Empire, and provides the Empire with one-fourth or one-fifth of its dental practitioners. The number of students, which has to bear a certain proportion to the number of medical students, is about 360. The various sections now contain 114 dental chairs, the attendance of patients in the year has risen to about 100,000, and last year the work done for patients comprised 27,000 fillings, 25,000 extractions, and 2,200 dentures. In the children's department over 1,200 children were under treatment during the year for regulation of teeth and correction of facial deformities, and in the *x*-ray department over 7,000 patients were dealt with. Emphasis was laid on the need for more room, a difficult problem at Guy's in view of its situation in a crowded London area, but it is hoped that the jubilee next year may be marked by some extension. It was in February, 1889, that the first dental student entered Guy's. The first dental school consisted of a single room with twelve wooden chairs. But the interest of Guy's in dental education dates back much earlier: a dental surgeon was appointed to the staff in 1799. The dean pointed out the understaffing of the dental profession: there are only three dentists for every 10,000 of the population, and dentistry is almost the only learned profession which still provides any amount of room for young people.

Analytical Chemists' Dinner

The Society of Public Analysts and Other Analytical Chemists held a dinner on March 4 to commemorate the sixty-fourth anniversary of the foundation of the society. In proposing the toast "His Majesty's Judges" Mr. E. R. Bolton said that they were the admiration of the world. He made a plea for the institution of a Chair of Chemical Jurisprudence. In response Mr. Justice Singleton paid a tribute to the courage and right-doing of juries who had to determine important questions of fact. The efficiency of juries and the interest and trouble taken by jurors, both men and women, in a serious case to get the right result spoke well for the future of this country. In proposing the health of the society Mr. Norman Birkett, K.C., said that while he agreed with Mr. Bolton in his eulogy of the judicial bench, there were times when he felt that the jury had not taken a correct view of the case. In reply the president, Dr. G. Roche Lynch, asked those present to drink the health of Dr. Bernard Dyer, the only living foundation member of the society. Mr. A. L. Bacharach proposed the toast of "The Guests," and Lord Cornwallis, Sir Philip Game, and Sir Robert Pickard replied.

Committee Against Malnutrition

At a meeting held by the Committee Against Malnutrition at the Royal Society of Arts on March 3 to emphasize the nutritional aspects of the national fitness movement, Miss Marjorie Green (secretary of the Children's Minimum Council) recalled the grave doubts that had recently been expressed regarding the "assessments of nutritional states" in the schools. Quoting from the findings of Mr. Huws Jones in Liverpool and from private communications received from a number of school medical officers, she considered that part of the difficulty lay in the interpretation of the term "normal." Was this a standard of full physiological attainment or merely an average? Experience suggested that we had come to accept one standard for children of the well-to-do and another for children of the poor. The present methods of assessing malnutrition in school children were valueless from a scientific point of view, and from a practical point of view were certainly dangerous. Professor W. E. Le Gros Clark thought that in any scheme to improve national health and physique it was essential to have data regarding the present standard of the population, and particularly of the growing population. It was not easy to find a standard of normality, though this was essential. Rejecting the height-weight-age index as insufficient, the speaker mentioned with approval the ACH index employed by the American Child Health Association; work of this description needed the co-operation of statisticians, anthropometricians, and, above all, of expert clinicians accustomed to the examination of children. Professor Le Gros Clark referred to experiments that were in

progress to determine whether the rate of growth of the finger-nails could be used as an indication of the nutrition of children, and remarked on the value of the vitamin tests now employed by Dr. L. J. Harris. In his own opinion it would be necessary to discover the "normal" from an examination of a large sample of children known to come from families which were comfortably off and to have had the benefit of a good diet and wholesome environment. Professor J. R. Marrack, illustrating his remarks with slides, gave a brief account of the development of modern dietetic knowledge. He referred especially to the effects of deficiency of vitamin A upon the visual purple and upon the surface of the eye; it was probable that such deficiencies manifested themselves in slow rate of growth and in impairment of the powers of the epithelium to resist infection. It was, in the speaker's opinion, undesirable to rely on vitamin doses; the necessary constituents should be obtained from a thoroughly balanced diet consumed in comfort and without anxiety of mind. Only then could the body take full advantage of the food absorbed. Dr. Janet M. Vaughan also illustrated her remarks with slides, showing statistical evidence of anaemia in the women and infants of the working class. It was her task to explain the character of one type of food deficiency as it affected the health of the population. While iron preparations could effect surprising improvements in health, it was better that the iron should be supplied through the normal diet. Women had informed her that the iron medicaments had the disadvantage of "making them feel too hungry." This in itself suggested that an all-round supplement of diets in poorer families was necessary.

Correspondence

After-effects of Modern Treatment of Carcinoma

SIR,—It would be a thousand pities were Mr. Percy Furnivall's account (*Journal*, February 26, p. 450) of his unhappy experience following radiation treatment for an epithelioma of the pharynx to receive wide acceptance as an accurate picture of what is to be expected as the normal or usual sequence of events.

The position that Mr. Furnivall made for himself in the surgical world a decade ago, and his reputation for cautious judgment and keen inquiry, coupled with very natural sympathy for his protracted sufferings, will naturally focus the attention of all who are in any doubt about the best method of dealing with this kind of growth, and may put a brake on the onward march of progress which in this type of carcinoma in particular has shown such notable advances.

These advances have not been gained without many misadventures, but happily they are becoming increasingly rare; and if there is one fact that stands out above all others in the welter of failures, recurrences, radio-necroses, and all the other miseries that we have had to deal with in the past it is that we have learnt that no matter how carefully and how scientifically radium needles or radon seeds may be implanted, particularly in a soft and yielding structure like the pharynx subject to constant movement and disturbance, it is a physical impossibility to ensure a strictly homogeneous field of irradiation. There are bound to be areas where the degree of radiation is much above the general average of the irradiated field, and if on the top of this a major dose of *x* rays reaches the affected tissues disaster is only too probable, with the long-drawn-out misery of radio-necrosis as a consequence.

The radium bomb would now appear to be the answer to pharyngeal carcinoma, and is receiving increasing recognition in this country. It is not, of course, a complete answer in every case—that would be too much to hope—but given the necessary care and knowledge on the part of those responsible for its application, and the courage and determination required by the patient to undergo a tedious and distressing treatment, the results are more satisfactory than anything ever seen before, and twelve weeks rather than twelve months may be regarded as the average and normal period of disability.

Mr. Furnivall is a man of high courage, and is, I am sure, not asking for sympathy, but it may be some comfort to him to know that those of us who have had large experience of these cases, and of the kind of complication he has experienced, recognize that in cases where radio-necrosis has been extensive the destruction of the growth is so much the more complete and permanent. His ultimate and complete recovery is therefore assured, and it will be the earnest hope of all of us that it may be soon.—I am, etc.,

London, W.1, March 1. CECIL ROWNTREE.

SIR,—Mr. James Phillips's remarks on deep *x*-ray and radium beam therapy (*Journal*, March 5, p. 538) are on a par with his statement that "ultra-violet rays produce senile changes." Can it be thought that the multitudes who travel every winter to Central Europe, the Riviera, and further south in search of the sun find the effect is senility? On the contrary, with few exceptions they return rejuvenated. Individual patients have a "dose limit" for *x* rays, radium, and sunlight, as they have for certain drugs; the history and clinical judgment should enable one to select cases suitable for full doses in an attempt to cure and cases suitable for milder palliative methods. I can recall patients treated with full courses of deep *x* rays many years ago for testicular and uterine primary malignant conditions who have not only not suffered but on the contrary are fit for their usual duties and are happy; at my weekly out-patients' follow-up department I see many cases in a state of normal health and good spirits. Not only the total dosage but the time factors in its administration and the methods used (for example, minimal dosage to normal parts) are of consequence, as are associated factors, such as the blood count, diet, exercise, etc.

Mr. Percy Furnivall has been unfortunate in having much pain following the implantation of radon seeds and deep *x*-ray therapy. In planning such combined treatments it is very difficult to judge the safety margin of total dosage; the intense caustic effect around radon seeds is apt to be followed by pain, still more so if the treatment is supplemented by full doses of deep *x* rays; hence the increased use in recent years of either deep *x* rays or teleradium, without insertion of needles or seeds, for primary malignancy of the tongue and tonsil. Needles or seeds are reserved by many for small, highly resistant residues, or for late recurrences seen at an early stage.

Mr. Phillips seems to regard Mr. Furnivall's disability as due entirely to *x* rays, whereas it would seem primarily to be an unfortunate result of the insertion of radon seeds, as the local condition is now apparently a radium necrosis: "an ulcer with a wash-leather slough on it about the size of a penny piece where the original growth had been." Mr. Furnivall himself refers to his "radium neuritis and myalgia." "Not too much of anything" is a motto which must often be generously interpreted in

accepting the responsibility in suitable cases of treating malignant disease if a cure is to be achieved by surgery or by radiotherapy. The condemnation of irradiation as a method because of rare cases of overdosage and damage is as groundless as the disparagement—in London, too, and towards the end of a dark winter—of the virtues of ultra-violet light!—I am, etc.,

London, W.1, March 5. J. H. DOUGLAS WEBSTER.

SIR,—Mr. Percy Furnivall's account (February 26, p. 450) of his treatment by radium and *x* rays for a small epithelioma indicates what must have been suffered by many patients following similar treatment. His trigeminal pain was almost certainly due to the radio-necrotic ulcer remaining at the site of the primary lesion. Perhaps surgical excision by the knife or by diathermy would leave an ulcer with a normal blood supply which would granulate normally, besides providing immediate relief of the pain and a corresponding improvement in the patient's condition. The reason for the radio-necrosis is, without doubt, local overdosage. I think there is good evidence to show that such overdosage can be avoided to a large extent by ensuring that the radium or radon is distributed in such a way as to ensure homogeneous tissue dosage totalling 5,500 to 6,000 *r* over about two weeks. The physical principles and their clinical application in the treatment of lesions by radium have been worked out by various investigators. In England, Mayncord of the Cancer Hospital and Paterson and Parker of the Holt Radium Institute, Manchester, have provided us with adequate data, and the papers of the latter workers are particularly useful. I hope that the experience of Mr. Furnivall will persuade more of the people engaged in radium therapy to apply the principles of radium dosage rationally. With regard to the treatment which he received in America, I feel sure that the principles above described were not followed, because in a recent visit to America I found no clinic in the United States, of many visited, where accurate spacing and application of these principles were carried out. The malaise and local symptoms due to the *x* rays were unavoidable, and with such a dose only temporary. I think that the account given by Mr. Furnivall justifies a special plea for extreme care and the rational scientific application of known principles in dealing with every case treated by radium or radon. Mistakes are bound to occur in everyone's experience, but will be much less common if this plea is heeded, while the reasons for them will be understood.—I am, etc.,

F. ELLIS,
Sheffield, March 2. Medical Director, Sheffield Radium Centre, Royal Infirmary.

SIR,—I am surprised at the number of letters I have received from strangers about radium treatment, following the publication of my own case in Clinical Memoranda on February 26. I hope to answer them all in time. These letters show that disastrous results occur more frequently than I had any idea of; and that patients are not told beforehand of the possibility of such results. I am now more than ever convinced of the necessity of further research on the effects of radium emanations, and care in selecting cases for radium treatment; also the inadvisability of handing out radium for indiscriminate treatment.—I am, etc.,

PERCY FURNIVALL,
Consulting Surgeon to the
Northam, N. Devon, March 5. London Hospital.

Scapulo-humeral Periarthritis

SIR,—I have read Dr. Douthwaite's article in the *Journal* of February 26 with some interest, more particularly as I disagree largely with the views therein expressed.

I have treated a number of cases of periarticular fibrositis of the shoulder-joint by the method advocated by Dr. Douthwaite, but have long given it up in favour of less drastic but equally satisfactory methods. Though it may prove quite a satisfactory proceeding to break down by forcible measures isolated adhesions resulting from injury to an otherwise healthy shoulder, it is quite another matter when the joint capsule, subacromial bursa, tendons, and other structures are all matted together by diffuse periarticular fibrositis. The force required to break down adhesions in such cases and obtain immediate free movements of the joint is very considerable, and inevitably results in injury of the tissues involved. I personally know of one case where an enthusiastic manipulator succeeded in causing a fracture through the neck of the humerus, and I understand that this is not an isolated instance. Forcible tearing of adhesions results not only in "loud snaps" but in exudation of serum or blood, with inflammatory reaction likely to set up more fibrosis and so retard, rather than hasten, the patient's ultimate recovery. The majority of these patients, as Dr. Douthwaite's cases show, are middle-aged or elderly people, many of them in indifferent health, and it appears quite unnecessary and, I venture to think, quite unjustifiable to subject such patients to the severe general disturbance and still more severe pain which may last for a week or more after forcible tearing of adhesions.

Dr. Douthwaite's observation that the treatment of this condition by baths is "futile and waste of time" argues a lack of experience. These cases, which incidentally are very common, respond, as a matter of fact, quite well to suitable forms of balneological treatment such as hot "undercurrent" douches in an immersion bath, hot packs, manipulation in a pool bath, etc., followed by massage and graduated passive movements. Treatment should, in any case, be sedative in type with a view to relaxing muscular spasm—to which, incidentally, much of the pain and rigidity is due—increasing circulation through the neighbourhood of the joint, and reducing inflammation.

Whatever form of treatment is adopted it is quite true, as Dr. Douthwaite remarks, that the active co-operation of the patient is required to attain a satisfactory result. My own experience is that as this "active co-operation" is so much more painful following forcible manipulation than it is during or after a course of balneological treatment, one is more likely to obtain it with the latter. Having given both methods a fair trial, I can confidently say that treatment on the lines I have indicated above is equally satisfactory and much less painful, and so less detrimental to the general health of the patient, than that advocated by Dr. Douthwaite.—I am, etc.,

Bath, March 1. F. G. THOMSON, M.D., F.R.C.P.

SIR,—Under this title Dr. A. H. Douthwaite has described (*Journal*, February 26, p. 441) a condition which has attracted attention during the last few years. Possibly this has been so, not only because of the number of sufferers but because of the success of treatment by movement of the joint under anaesthesia. In the majority of cases treatment by heat, massage, and exercises alone seldom cures the condition. Dr. Douthwaite has cured

all his patients, except for two who have had some persistence of pain, and in resistant cases he carries out manipulation at more than one sitting.

The method of manipulation he describes is that "the scapula should be immobilized so far as possible by a band passing around the chest and held on the opposite side by the assistant. Forced shoulder movements must be brisk, and should be carried out in the normal planes of movement." Presumably there was no intention of giving a detailed description of the necessary manipulation of the joint, but the above two statements are obviously open to criticism. Fixation of the scapula by a band held by an assistant has always seemed to me impossible. Movement can be restricted almost entirely if the patient is placed on his face and the scapula held by an assistant, but as this is an uncomfortable position for the operator it is not recommended. Secondly, with regard to movement, it is not clear from Dr. Douthwaite's account if the manipulation should consist in the movements of flexion, extension, abduction, and adduction in the scapular plane only (Johnston, *Brit. J. Surg.*, 1937, **25**, 252), or whether rotation is to be acquired by movement in the four directions mentioned.

In manipulating the shoulder the difficulty of fixation of the scapula and manipulation of the humerus on it can be overcome by reversing the procedure. The patient lies flat on his back with the affected side at the edge of the couch. The arm (and scapula) are abducted as fully as possible, the humerus is fixed by grasping the arm with one hand, and the axillary border of the scapula is pushed away from it by the operator's other hand with "brisk movements." This frees abduction. The patient's arm is then internally rotated while still in abduction and the scapula again moved. The arm is then externally rotated and again the scapula is moved. It is most important that the humerus should not be forcibly rotated on the glenoid, as complications, such as effusion into the joint or fracture of the neck of the humerus, are liable to occur in elderly patients.—I am, etc.,

London, W.1, Feb. 28. ST. J. D. BUXTON.

Transport of Iron

SIR,—Reading the leading article with the above title on page 455 of your issue of February 26, I was a little disappointed to find no reference to the work of Dr. George Barkan, who has been experimenting and publishing papers relating to the subject for the last thirteen years, and who, in his last communication, in conjunction with Dr. Otto Schales,[1] was, I thought, particularly suggestive and inspiring. The issue of this paper was subsequent to the publication of the book and the two papers mentioned in your article, but it appeared in the early part of the current winter session.

One cannot cover the contents of such a paper in a short letter, but the following points are of interest in the matter of the "leicht abspaltbares Bluteisen," which one may dub the "loose iron" in the blood. The smaller and quantitatively more variable plasma fraction (originally called E^1, and now considered as a pseudo-methaemoglobin), since it appears derived from the larger corpuscular fraction (originally called E, and now considered as a pseudo-haemoglobin), I shall leave over just now, simply stating that the iron in it is supposed finally mostly to leave the corpuscle to become attached to the globulin of the plasma, thereby contributing to the sum of the iron in the plasma. Within the corpuscle oxidative rupture, at one methine bonding of the porphyrin ring of haemoglobin, is supposed to lead to formation of a pseudo-haemoglobin, from which the iron becomes capable of extraction by weak acid (0.1 N). The deferrification of fraction E fails to yield a porphyrin. The opened porphyrin ring is supposed to yield bilirubin, and to contribute, after combination with serum albumin, to the plasma stock of that substance. The well-known reversible combination of the corpuscular substance yielding "loose iron" with both oxygen and carbon monoxide (the CO affinity said to be 800 to 2,000 times the O_2 affinity) is taken as related to the pseudo-haemoglobin structure, as also the paralysis of the weak acid extraction effect by carbon monoxide.

Barkan's present view, then, is that the substances yielding "loose iron" to weak acid are intermediates in the degradation of some of the haemoglobin of the corpuscle to bilirubin, and, on this idea, a constant slow passage of both iron and bilirubin into the plasma is occurring. The experiments detailed in the paper appear to me to withstand criticism, and I hope that the ideation may assist progress in knowledge of this matter.—I am, etc.,

Edinburgh, March 1. E. W. REID.

[1] *Z. physiol. Chem.*, 1937, **248**, 96.

Iron for Subnutrition

SIR,—I was interested in the article on the effect of iron administration in cases of subnutrition, by Drs. E. Blackstock and J. M. Ritchie of Birkenhead, which appeared in the *Journal* of March 5 (p. 512).

For at least ten years at the Heckmondwike School Clinic I have recommended ferri et ammon. cit. to parents whose children presented a clinical picture similar to that described therein. My results over this fairly long period entirely support the conclusions reached by the authors of the article.—I am, etc.,

G. H. PEARCE, M.D., M.R.C.P.,
Batley, March 7. Medical Officer of Health.

The Shortage of Nurses

SIR,—I think that your readers will agree that the medical profession could not exist and function without the aid of the nursing profession. Yet I submit that we are doing little or nothing to avert the Nemesis that will shortly fall upon, and paralyse, at any rate the smaller hospitals. I refer, of course, to the great and growing difficulty of recruiting nurses. I am aware that an Interdepartmental Committee is dealing with the subject, but these Government committees work all too slowly.

The subject is a vast one, but the chief troubles seem to be the lack of financial inducement to enter the nursing profession, and, even more than this, the very bad advertisement given to the profession by the conditions which exist in many hospitals. Every year a larger and ever-growing section of the community is treated in hospital, and hospitals can no longer claim to be regarded as charitable institutions, yet nurses are still exhorted to consider their work as a vocation—"they *give* their services to the poor and needy," etc. Nurses could be and should be better paid. This would serve two purposes: first, it would encourage recruiting; secondly, and this is perhaps even more important, it would enable a properly constituted central authority to enforce a sufficiently large yearly levy on the nurse's salary to ensure an adequate retiring pension—say, at the age of 50. This would go a very long way towards eliminating that dreadful incubus of the profession, the ageing matron, who can

never hope to get another job if she loses her present one, and therefore becomes a time-server to hospital committees, which in many instances are still only too ready to economize at the expense of their nursing staff both in respect of numbers in relation to occupied beds and also as regards the way in which they are fed and housed. I think too that the General Nursing Council and/or the College of Nursing should take to themselves greater powers, and pay at least half-yearly visits to recognized teaching hospitals to see that probationer nurses are properly cared for and not overworked.

I hope, Sir, that you will publish this letter and that it may serve to stimulate medical members of hospital committees to inquire more carefully into the conditions under which their nurses work.—I am, etc.,

Great Yarmouth, March 5. R. LEONARD LEY.

Medical Secrecy and the Matrimonial Causes Act

SIR,—The first cases under the new Matrimonial Causes Act will shortly come before the Courts, and medical practitioners being to some extent affected by the provisions of the Act, it is interesting to examine the position. Evidence from medical practitioners will be required under Sections 2 (*d*) and 7 of this Act. Section 2 (*d*) provides that "a petition for divorce may be presented to the High Court . . . on the ground that the respondent is incurably of unsound mind, and has been continuously under care and treatment for a period of at least five years immediately preceding the presentation of the petition." As to whether a practitioner can say that any given person is "incurably of unsound mind" is of course for him to judge.

The real question affecting medical practitioners under this section of the Act is, Does the usual relationship of doctor and patient exist in such cases? It may be said that the patient does not voluntarily come to the doctor under whose care he or she will be, whether in a private or public institution. A patient is placed under the doctor's care by some person or authority who is responsible for the patient—whether it be a relation or a local authority matters little. It may be argued that the doctor is responsible not to the patient but to the person who employs him for the purpose of caring for the patient. In ordinary circumstances presumably a doctor without hesitation would give information regarding the health and prognosis of a patient to a husband or wife. Is, therefore, the extent of the information sought, or the purpose, a factor to be considered by a practitioner in giving or withholding information? It must be remembered that under the Act the interests of the patient in the event of a petition for divorce are safeguarded either by the patient's Receiver or the Official Solicitor, and the financial provisions of the old Act are made applicable to the new Act. Will the doctor, by giving such information, be committing a breach of professional secrecy? By refusing, he will be stultifying the law, particularly so far as poor persons are concerned, for the poor person will not be able to afford to requisition the services of a practitioner from outside the institution to examine the patient with a view to certifying, although those in more fortunate circumstances may be able to do so. Even in the latter case the outside practitioner could hardly form an opinion without being granted access to the records of the patient. It has been suggested that those practitioners working at municipal mental hospitals may seek to cover themselves by getting their visiting committees to direct them to give such information. Even if it were desirable that practitioners should shelter from their responsibilities in this way, would it safeguard a practitioner from a charge of breach of patient's privilege?

Section 7 is easier. Under it, suits for nullity may be brought on the grounds that either party was at the time of the marriage of unsound mind or a mental defect within the meaning of the Mental Deficiency Acts, 1913 to 1927, or subject to recurrent fits of insanity or epilepsy, or at the time of the marriage suffering from venereal disease in a communicable form, or at the time of the marriage pregnant by some person other than the petitioner. Obviously, here a practitioner must not give information obtained as a result of professional attendance except with the consent of his patient or under the direction of a judge.

It may be said that it is not the business of the medical practitioner to obstruct the law; but before they facilitate the law practitioners are entitled to know that their own interests are not jeopardized. The questions above referred to are of considerable importance as they raise new problems on the much-discussed question of professional secrecy, and the opinions of your readers will be both interesting and valuable to those who are called upon to advise on these questions.—I am, etc.,

RICHARD W. DURAND,
Secretary, London and Counties Medical Protection Society, Ltd.

London, W.C.2, March 7.

The Population Question

SIR,—Dr. Grace Leybourne in the *Sociological Review*, 1934, estimated that there would be a drop between 1931 and 1951 of about four million children (from nine and a half millions to five and a half millions), of workers under 45 of about one million, and an increase of those persons above the age of 45 of about two and a half millions. This is because we have been doing everything to save and prolong life and nothing to encourage its reproduction. Suppose the drop in young and the increase in old people were not so large, even only half that estimated, it would cause a profound economic disturbance in the next fifteen years—think of the schools, training colleges, children's hospitals, the supply of girls as servants and factory hands, of errand boys, typists, and clerks, of miners and labourers, of soldiers, sailors, and air pilots. The Minister of Labour has warned us that there will be a shortage of youthful labour, and the Minister of Health that there will be vacant places in the schools. Who is to pay for the pensions of the increasing number of aged if the earnings of youth fall away?

All the democratic countries, except Canada and Eire, have a birth rate considerably below maintenance level; England, France, Austria, Sweden, Norway, one of 15 per 1,000 or less; U.S.A., Australia, and New Zealand, 17 per 1,000 or less. On the other hand, the birth rate in Italy is 22 per 1,000—fully maintenance level; Germany recently has raised her level from 14.7 to 19 per 1,000. Poland, Yugoslavia, and Rumania have birth rates still considerably above maintenance level; Turkey has added two and a half millions to her population in recent years; Japan, numbering seventy millions, increases by about a million a year. Russia's population is expected to increase from a hundred and fifty to two hundred and fifty millions in twenty years. India under our rule has put on some forty millions in ten years, and now has a population of four hundred millions. It is surely obvious that we cannot maintain the British Empire on a population falling

off in youth and increasing the number of its aged. Is it not madness to spend colossal sums on social improvements and rearmament if heavy taxation leads to a fall in the birth rate, which saps the strength of the country, while the keeping alive of the aged takes away money which should enable the young to have children?—I am, etc.,

St. John Clinic, Feb. 28. LEONARD HILL.

Contraceptives and Fertility

SIR,—Not without reason did the ancients name the delicate arrangement of the ciliated epithelium of the cervix *arbor vitae*, a tree that the National Birth Control Association and its satellites would destroy root and branch in their adherence to, and advocacy of, highly acid chemicals and the application by septic fingers of various caps before or in the early days of matrimony. Quite apart from ethical, religious, or sociological reasons, surely they do not maintain that such fronded epithelium is likely to be unaffected by these irritants, and will accept the conclusive evidence and experience of Gardner Child (*Sterility and Conception*, p. 89); Beckwith Whitehouse (fourth edition of Eden and Lockyer's *Gynaecology*, p. 429); Blair-Bell (*Principles of Gynaecology*, p. 336); Meaker (*Human Sterility*, pp. 39 and 125); and others that such irritation gives rise to conditions which "make the endocervical mucus inimical to spermatozoa by creating a viscosity—such viscosity is a hostile factor, in that viscid secretions impose a barrier which spermatozoa are rarely able to surmount" (Meaker).

It was this condition which Mr. George H. Alabaster referred to and which goes on to the erosion and endocervicitis which is so commonly seen in patients who use contraceptives. Since the social, economic, and imperial policy of this country depends upon an increasing rather than a decreasing population, surely the promiscuous donation of advice to nulliparous young women is antisocial, however good the reasons may be for giving the same advice to parous women who wish to space their children. Only such advice, I understand, is given in the clinics of the Constructive Birth Control Society. Admittedly the problem is a thorny one, but it is not without interest to observe that orthodox Jewesses and Roman Catholics in the absence of hypoplasia are rarely found to be sterile. Why?—I am, etc.,

London, W.1. Feb. 25. V. B. GREEN-ARMYTAGE.

Miners' Nystagmus

SIR,—In your article (*Journal*, February 26, p. 465) which deals with the Departmental Report on Miners' Nystagmus you refer to my view that failure to work is caused by the breakdown of the man's ability to withstand the stresses of the mine—poor illumination and danger—and in contrast to this you go on to state that "in a large number of cases disablement is entirely due to ocular movements and the man is otherwise well."

I am very familiar with cases in which, at *first sight*, this may appear to be the case, but must point out that the observation that the man is "otherwise well," like every other observed fact, involves two elements—a fact, and an observer. It has been my experience that sufficiently prolonged and careful interrogation of these cases discloses that, with very rare exceptions, the apparently "well" man is the victim of a neurosis which arises either from the conditions of his employment or from some economic or domestic source. So often is this search for neurosis successful that one is tempted to think that in the remaining cases it may be the observer who fails rather than the neurosis which is absent. This view largely endorses the findings of Professor Millais Culpin, who has reported a series of thirty-six cases and whose further findings were outlined in a paper to the Royal Society of Medicine in 1933.

But even if it be taken that the pathogenesis of the ocular movements is itself physical and not psychological (personally I have an open mind on this point), I suggest that there is an extremely close relationship between the severity and distress on the one hand and the emotional state on the other, and I suggest that the determining factor in failure to work is psychological.

In one of my cases it was impossible to induce oscillation by any of the recognized means until, unexpectedly, a whistle in a speaking tube close to the man was loudly blown from an upstairs office. The man then gave a start and at once began to display oscillation.

In another case, a man aged 38, who appeared "well" apart from his eye movements, ultimately imparted the following information, which was only elicited with great difficulty and was not uppermost in his conscious thought. When he was 15 years old he had been walking along by himself in the mine when he had come across the body of a man who had been trapped and killed under a fall. This, he said, had upset him, but he had not allowed anyone to see how he felt, and had afterwards continued his work. More recently another man working in his proximity had received a seriously crushed back. The man's further statement—"As soon as I go down the pit I am finished straight"—was possibly associated with his mental state, and to describe a man as being, apart from eye movements, "otherwise well" would, I submit, constitute an incomplete observation of fact.

I further submit that the statistics quoted in my paper also indicate an important mental influence of economic factors.

Thirdly, among fifteen collieries of North Wales, *one*, and *one only*, remained completely free from certified cases of nystagmus during the ten-year period of my observations. This pit was not better lit than the others, though it used a good type of spirit lamp. There were no features which strikingly distinguished this pit from the others in the coalfield, except that the incidence of accident was extremely low. It was also noticeable that the ventilation system was particularly good, the seams were high, and also there was a particularly happy relationship between employer and employed; but it should also be said that this mine was situated at a considerable distance from all the others in the field and did not absorb many men leaving the other pits. It had been reported that some of the men in this mine did in fact show oscillation of the eyes, but the fact remains that no cases of disablement were recorded throughout the decade. The factors distinguishing this pit from the others were those capable of exerting a psychological rather than a physical effect.

It is not clear from the account in the *Journal* whether the Departmental Committee has followed the suggestion of the B.M.A. Committee in the particular mentioned on page 9 of the latter's report—namely, that the Medical Board should include "a physician with some knowledge of psychological medicine." If this advice has not been followed, it appears most regrettable. Personally I would have liked to hear that the Board would consist of a consultant psychologist and a physician with some special knowledge of the processes of mining; for I submit the general indications are that disability from the disorder does not particularly concern the department of the oculist.—I am, etc.,

Wrexham, March 2 RAYMOND BROCK.

Asthma and Sensitivity to Aspirin

SIR,—The problems in connexion with asthma seem to reach their peak in the aspirin-sensitive type. As originally noted by Dr. Alexander Francis and mentioned by him in the *Journal* of February 26 (p. 485), these people usually suffer from nasal polypi. Why is this so?

Although the aspirin-sensitive type is by far the most severe type of asthma one sees, such patients never touch aspirin from one end of the year to the other, except by some gross misadventure. Their attacks are almost always precipitated by a cough. Again, quite unlike other asthmatics, they may have the most dreadful asthma each night, requiring five or more injections of adrenaline to check it; yet by day the chest may be perfectly free from all adventitious sounds. I have only seen twenty-three of these cases in the last 1,000 asthmatics, mostly in women. In the more recent cases there has been found a *Staphylococcus citreus* in the nose. Probably the polypi are a true allergic manifestation according to von Pirquet. The most recent cases of all have responded very satisfactorily to vaccine from this organism, given in minute doses. They belong to Group III, by the differential sedimentation test.

Another peculiarity of those sensitive to aspirin is that, whereas anaphylaxis in animals is shown by a definite syndrome affecting many parts of the animal, with aspirin only one "shock" organ seems to be affected in each patient. An overdose of dust or pollen produces urticaria, asthma, and sneezing, but aspirin will cause only asthma in one patient—even in the gravest forms, in which the patient becomes unconscious, there is no nettlerash. In another, aspirin always produces urticaria but never asthma. Another is sick, always sick, after aspirin, again without asthma or urticaria.

With regard to the treatment of the polypi, sufficient should be "removed" from time to time to keep the airway clear through the nose, possibly with some improvement to the sense of smell, but with no hope of improving the asthma and a fair chance of making it worse.—I am, etc.,

London, W.1, Feb. 28. FRANK COKE, F.R.C.S.

Ascorbic Acid in Urine

SIR,—I was interested to learn from the paper by Drs. Fleming and Burrows that sulphuric acid has been found unsatisfactory as a preservative of ascorbic acid in urine. It is perhaps of interest to note that in the course of a series of vitamin C estimations at present being carried out at this station we also have had cause to reject this method of preserving the ascorbic acid content of urine, but on rather different grounds from those given by your contributors. Attempts were made to preserve the urines by adding 5 per cent. by volume of dilute sulphuric acid (*B.P.*) sufficient to lower the *p*H to between 3 and 4. It was found that even in the case of fresh urines consistently higher reducing values were obtained by this method than in the case of urines treated with acetic acid. We then found that if a solution of 5 per cent. dilute sulphuric acid were added to a dichlorophenolindophenol solution under the same conditions as those obtaining in the actual titrations the colour of the dye was slowly discharged, showing that the acid has a destructive effect upon the dye. For this reason the use of sulphuric acid as a preservative has been discontinued.—I am, etc.,

E. A. G. GOLDIE, M.B., B.Ch.,
Civilian Medical Practitioner, R.A.F.

Royal Air Force Station, Peterborough,
Feb. 22.

Somatic Pain

SIR,—I wonder how many of your readers were, like myself, thrilled to the core by Sir Thomas Lewis's article in the *Journal* of February 12 (p. 321) on the subject of somatic pain. We now know much more than ever before of skin, muscle, and "web" pain: is it too much to hope that further investigation may add an equally, and perhaps more, important contribution to our knowledge of joint pain? The most interesting joints from this point of view are presumably unapproachable—namely, the sacro-iliac, and inter-vertebral and costo-vertebral joints. But many others are easily accessible, and knowledge of the nature of pain radiating from these might increase our knowledge of what happens in those less accessible. I hope Sir Thomas will forgive the hint, and, equally, that he may be induced to act upon it. It would help to solve the unknown answer to the question, "How does joint manipulation relieve referred pain?" That it does so in many cases is beyond doubt. As this is so, is it not possible that the relief is due to cessation of irritation of the sympathetic nerve supply to the joint? Our whole conception of the connexions of the sympathetic nervous system might thus be expanded and clarified, and another step be taken to afford scientific explanation of a clinical fact, the mechanism of it being still hidden from us.

Of Mr. J. H. Kellgren's article (*Journal*, February 12, p. 325) it may be hoped that, read in conjunction with Sir Thomas Lewis's communication, it will lead to a long-established (though modified) therapeutic measure being more widely adopted. To practitioners of physical medicine and to many others the facts about the nodal points of muscular sensitiveness with which he deals are common knowledge. Let us hope this article will change the "hundreds" into thousands, and that much unnecessary pain and incapacity will thus be saved. Unfortunately Mr. Kellgren appears to ignore the possibilities of pressures, frictions, and needling in the treatment of the "nodal points" from which pain is referred.

There is one notable omission in this paper. When searching for the point at which to give the injection it may be localized as a rule far more accurately by faradism than by pressure. Indeed, not infrequently acute sensitiveness to faradism of pin-point dimensions will reveal the appropriate spot even when pressure fails to elicit any sign of sensitiveness. Moreover, if the spot indicated by pressure does not coincide with that indicated by faradism, it is wise to select the latter as the site for injection. Sometimes the sensitive area from which pain is radiated is too diffuse for injection with novocain or for treatment by pressure. In this event a very brisk reaction dose of ultra-violet light may either clear up the condition without further treatment or suffice so to diminish the general sensitiveness that the nodal point can be localized by faradism to a nicety. Finally, when the area involved is really widespread, a subcutaneous injection of oxygen will often prove successful when all other methods have been tried and found wanting. It is particularly efficacious when pain is marked as a result of "skin rolling."

One last word. Is there anything really new about the injection treatment of these nodal points? Formerly treatment by "needling" was a favourite prescription. The red-hot needle gave way to needling without heat; this tended to die away until revived by the use of the galvanic needle; and now we—in the kindness of our hearts—use a local anaesthetic. Is it the anaesthetic nature of the material injected, or is it the needling, that "does the trick"? Perhaps Sir Thomas can help us with

the answer. Certain it is that, when injection has failed, injection followed by a very free "needling" throughout the injected area will bring relief, and particularly if the area is subjected to a process of (not too vigorous) hammering of the area by blows from a mallet transmitted through a rod of wood protected by a felt pad.* Whether this treatment forces the injected fluid away from the spot "hammered" with sufficient force to stretch any adhesions that may have formed round the nodal point is a matter for speculation. The fact remains—it works.—I am, etc.,

London, W.1, Feb. 25. JAMES MENNELL.

P.S.—Another problem for Sir Thomas Lewis. Can he tell us how the reaction dose of ultra-violet light diminishes sensitiveness? Is it due to chemical action and perhaps the formation of histamine?—J. M.

Referred Pains Arising from Muscle

SIR,—During the past two years I have used novocain injections in treating muscle, bone, and joint injuries. I therefore read Mr. J. H. Kellgren's article in the *Journal* of February 12 (p. 325) with great interest, and I should like to congratulate him on the careful and accurate recording of his cases. I have described the results obtained with this method of treatment in the *Journal of the Royal Naval Medical Service* (January, 1938, p. 48), and also recorded my finding that the results in cases of shoulder injury are very uncertain, this being almost certainly due, as Mr. Kellgren has shown, to the fact that referred and "true" pain are confused by the patient. With such careful records as Mr. Kellgren has kept this difficulty should soon be overcome. Mr. Kellgren has confined his article to muscle pains, but it has been found that bone, joint, and muscle injuries can all be relieved by novocain. I think that the discovery of this method of treatment should be credited to Professor René Leriche of Strasbourg, who as long ago as 1928 described this method in the treatment of sprains, and has since extended its application (*La Presse Médicale*, 1930, No. 25).—I am, etc.,

Dundee, Feb. 27. WALTER GORDON CAMPBELL.

Chronic Littritis

SIR,—Dr. R. C. Webster is to be commended for directing attention, in his paper on chronic littritis (February 26, p. 448), to the dangers associated with the use of the hand syringe in the treatment of acute gonococcal urethritis. While in full agreement with this conclusion, I find it difficult to accept the pressure theory by which he explains this fact. He admits that the use of unusual, or too concentrated, solutions as irrigating media tends to produce chronic littritis, and this statement cannot be reconciled with the pressure theory advanced. It is inconceivable that the glands of Littré and the ducts leading from them to the urethra escape infection in acute urethritis, in spite of any valve-like action which might be postulated for the ducts in virtue of their tortuous path from the submucous layer to their openings on the surface of the urethral mucosa. I therefore submit that acute infection of the glands of Littré in varying degree is commonly associated with acute urethritis, and I believe that the production of chronic littritis, assuming a normal resistance on the part of the patient, is dependent on failure to promote and maintain adequate drainage of the infected glands and ducts. This failure may arise through several causes, which include improper irrigation whereby the potential space of the urethra is insufficiently, or too seldom, adequately dilated, and also premature closing of the ducts consequent on fibrosis due to the use of too concentrated irrigating solutions, a second infection of the urethra, or unusually rapid resolution of the inflammation which, in some cases, may follow the use of the sulphonamide preparations. The prevention of chronic littritis therefore depends on the institution as early in the disease as possible of regular irrigations, using the proper concentration of a suitable solution at the optimum temperature (105° F.), and on ensuring that the correct technique of douche-can and nozzle irrigation has been demonstrated to, and is being practised by, the patient. Urethral lavage with the hand syringe cannot hope to achieve an adequate and even dilatation, nor can the irrigating fluid be maintained at the correct temperature.

The following figures from cases recently treated in Liverpool appear to support these views. In 132 patients with gonorrhoea chronic littritis developed in eleven; two gave a history of previous gonorrhoea, one reported for treatment six weeks after the appearance of the discharge, one had irrigated with a douche can at home without instruction or observation, one had difficulty in irrigating satisfactorily due to severe phimosis, and two had used a hand syringe. Again, of twenty-five cases of acute urethritis in which irrigations and sulphonamide were used concurrently from the beginning of treatment, twelve developed persistent chronic anterior urethritis; but of fifty-three cases in which sulphonamide was given after the patients had been irrigating for about a fortnight, only five developed chronic anterior urethritis. In all cases gonococci were demonstrated and syphilis excluded, and the diagnosis of chronic littritis was based on the persistent presence of threads in the first glass of the two-glass test, with palpable Littré's glands in cases in which the urine had been clear and the prostate and vesicles free from pus cells.—I am, etc.,

Liverpool, March 1. SYDNEY M. LAIRD.

Treatment of Boils and Carbuncles

SIR,—I was much interested in Mr. John Hosford's article (February 19, p. 400). I have treated boils and carbuncles successfully by means of short-wave diathermy, and I think that this method deserves some recognition. The machine I use has a 6-metre wave-length, and I find that one treatment lasting five or seven minutes is sufficient to abort a boil in the early stages. If it is more advanced matters are brought to a head within about eight hours. I have also used *x*-ray therapy for boils, employing voltages varying from 90 kV up to 200 kV, delivering 200 *r* at the surface of the lesion. Short-wave diathermy is much more certain in its results. Carbuncles may require one or two treatments, but even large sloughing areas, 10 cm. or more in diameter, will respond to the treatment.—I am, etc.,

Glasgow, March 2. S. D. SCOTT PARK.

Br. abortus Infection Treated by Sulphanilamide

SIR,—I should like to add the report of a third case of *Br. abortus* infection to those already described in the *Journal* by Dr. J. H. Lloyd (January 15, p. 145) and Dr. N. Matthews (February 26, p. 483). In January I was asked to see a boy aged 10. His mother had noticed that he was looking pale and out of sorts, and found that he had a temperature of 102° F.; as he was not

* Reference is made in the issue of February 26 (p. 488) by Dr. Stuart Goldhurst to the efficacy of this treatment as described by Dr. T. Stacey Wilson.

complaining of any ill effects he was put to bed and regarded as suffering from influenza. His temperature, however, continued to rise each day to 102° F. or 103° F., and since there appeared to be no change in his condition I was asked to see him after he had been in bed ten days. His temperature was then 102° F., but apart from this no physical signs were to be elicited.

On the strength of the history and the paucity of clinical findings I made a tentative diagnosis of a *Br. abortus* infection, and immediately started the patient on one tablet of prontosil album four-hourly. His blood was examined by Professor W. J. Wilson of Belfast, who reported that agglutination occurred with *Br. abortus* up to 1 in 2,500. After twelve days the temperature remained below 100° F., and the dose of prontosil was then reduced to one tablet eight-hourly; this was maintained for a further ten days. By this time the temperature was only rising to 99° F. every second or third day. The prontosil was then discontinued, and after four more days the temperature remained normal. At no time was the spleen palpable. Including the ten days that elapsed before I saw him the illness lasted altogether approximately five weeks, which is, I think, sufficiently short of the usual period to be noteworthy. In this case there was no sudden fall in temperature, such as Dr. Lloyd and Dr. Matthews have reported. The temperature, which was recorded four-hourly, gradually stepped down over a period of twenty-two days.

There is an impression among many medical men that drugs belonging to the sulphonamide group are highly toxic. It is interesting to note that a boy of 10 years took 675 grains of prontosil album in twenty-two days without showing any ill effects. The usual precautions regarding (*a*) sulphur intake and (*b*) agranulocytosis were of course taken.

On another aspect of this disease I would welcome information. I have a friend who a few years ago suffered from abortus fever for seven months. He would willingly have given his serum for use in this case. I have been unable to find out whether such serum has been used before. I have since heard, however, of a case of abortus fever which was admitted to a hospital in Belfast some years ago. This patient ran the usual temperature for about three weeks. He then accidentally got an injection of "normal cow serum," and from the following day his temperature remained normal. The doctor who told me of this case thinks that possibly the serum had been obtained from a cow which had recovered from abortus fever. As I now have two sources from which I can obtain serum I should be very glad to know if it has been previously used.—I am, etc.,

Lisburn, March 3. W. A. PAGE, M.D.

Time for Midwifery

SIR,—Dr. John Elam (*Journal*, February 26, p. 485) is wrong in suggesting that I have not studied the Maternal Mortality Report for 1937. I have studied all the recent reports on that subject, and the more I study them the more convinced I am that my suggestion regarding the postgraduate training of practitioners who intend to practise midwifery is correct. How many of us would trust our wives to a man who had no more experience of midwifery than he had gained during his student days? There is a difference between "want of time" and "want of taking time." The man who has not enough time for midwifery should not practise it. There is no excuse for "not taking time." A man who has a sound training in midwifery will understand that parturition is a normal physiological process and that the less it is interfered with the better. He will not let himself be hurried into interference either by the patient, her friends, or his golf appointment. He will know how to diagnose a position correctly, and when and how to apply forceps. "Failed forceps" cases will become less frequent. I do not agree with Dr. Elam that the conduct of the normal confinement is best left in the hands of the competent midwife. Two years ago my son was engaged to attend a woman. He diagnosed a breech position. The midwife (competent according to the health authorities) told the woman that my son was wrong. The result was that my son received a note cancelling the engagement. Time proved him correct. A year or two ago a patient of mine returned from a municipal home with a complete perineal tear. She had not been seen by a doctor. My partner tells me he has seen five other cases of the same kind in the last three years.—I am, etc.,

Birmingham, Feb. 26. ROBERT ANDERSON.

SIR,—With reference to Dr. Elam's letters I am of the opinion that medical women are not always the best to attend obstetric cases, nor do I agree that they have more time at their disposal than men. In this county we have a very large number of well-informed medical men who practised obstetrics long before a county hospital service was available. They have done magnificent service in the past and have welcomed our hospital and emergency services.

I am also of the opinion that no man can efficiently practise his calling without having had sufficient training. The medical student of to-day has not enough obstetrical experience, though material available in many of our municipal maternity hospitals is not being utilized to anything like its full extent. The recently qualified man who has gone into practice on his own without having obtained sufficient experience in obstetrics is the one who is likely to find himself in difficulties. I can sympathize with this young man, who admits failure in the eyes of his patient if he calls in an experienced practitioner. The new Maternity Services (Scotland) Act, 1937, provides for a domiciliary service. Those who are to carry out the provisions of the Act must have a sufficient knowledge gained either before or immediately after graduation.—I am, etc.,

County Maternity Hospital, Lanark, Feb. 28. H. J. THOMSON.

Founders of British Otology

SIR,—It has afforded me great pleasure to read in the *Journal* of February 26 (p. 464) a recognition of the debt which British otology owes to James Yearsley, who is justly entitled to be considered as the first Englishman to establish our special branch of surgery upon a sound clinical basis. In an article on the foundations of British otology, published in the *Journal of Laryngology* for August, 1913, I pointed out that "at least six great names must endure as inseparable from the rise and growth of British otology—William Harvey, John Hinton, George Pilcher, Joseph Toynbee, William Wilde, and James Yearsley"—and I insisted that the work of the last-named foreshadowed much of what is the basis of modern treatment and prevention, because it was he who first stressed the connexion between deafness and diseases of the nasopharynx. He was the first to advocate the removal of tonsils (he removed those of my own father), and he nearly discovered adenoids. The soundness of his doctrines is to be found in his written works. The Yearsley family is an old one, and my tree goes direct

through the male line to the Wars of the Roses. Our ancestor, who held manors in Yorkshire, was an officer of the Wardrobe of King Henry VI. From him came the Gloucestershire branch, and in this branch James Yearsley was a first cousin to my grandfather (also a James), the latter belonging to the senior line. The tree shows descent in the male line from the Yorkshire Yearsley above mentioned through fifteen generations to my own son. James Yearsley was a man of fine presence and ready wit, and there are many amusing stories of him. —I am, etc.,

London, W.1, March 1. MACLEOD YEARSLEY, F.R.C.S.

Obituary

HAROLD SIMMONS, M.B., B.S.

Consulting Surgeon, Royal Victoria and West Hants Hospital, Bournemouth

We have to record with much regret the death on February 22 of Dr. Harold Simmons of Bournemouth. Although in his seventy-sixth year he had continued in the active work of an extensive general medical practice, doing a full day's work with keenness and enthusiasm, until illness laid him aside a fortnight or so before his death. He had qualified L.S.A. in 1884, M.R.C.S. in 1885, L.R.C.P.Lond. in 1887. In 1894 he proceeded to the M.B., B.S.Durh.; in 1895 to the D.P.H. of the English Conjoint Board. He was a student of the Bristol Medical School and of the Middlesex Hospital. Before settling in practice he occupied the posts of house-physician at the Middlesex Hospital, resident medical officer at the Royal Hospital for Diseases of the Chest, City Road, and assistant medical superintendent of the Fulham Infirmary. For an interval he acted as medical officer on ships of the Union Castle and P. and O. shipping lines.

Dr. Simmons had practised in Bournemouth for forty years, being for the greater part of that time associated with the Royal Victoria and West Hants Hospital, first as assistant surgeon, which post he resigned shortly after the war, being then appointed a consulting surgeon to the institution. Before the amalgamation of the Royal Victoria Hospital, Poole Road, with the Boscombe Hospital he was medical officer to the out-patient department of the former. During his long association with the hospital he took an active part not only in the professional side of his work but also in the management of its affairs. Up to the last he was a member of the house committee and of the medical council, to both of which he frequently contributed from his wisdom and long experience. Soon after qualifying he became a member of the British Medical Association, and he had been chairman of the Bournemouth Division. He was a member of the Bournemouth Medical Society; and from the start of the movement was a keen, attentive Rotarian. An enthusiastic motorist, he was one of the original members of the Hampshire Automobile Club founded in the year 1906, being honorary treasurer of the Southern Division of the club. For a great many years Harold Simmons was police surgeon for the County Borough, being frequently called upon in the course of his work to give medical evidence in the cause of justice. As a police witness he was exact, thorough, quite unprejudiced; could always be relied on to adhere to facts and, when called on, to offer expert medical guidance which was scientific, just, and eminently fair. What will, perhaps, remain as a delightful memory to friends and colleagues alike was the unfailing sense of humour which he possessed as well as the wisdom he brought to bear in all his relations with his colleagues—by whom he was held in the highest respect. At the funeral service former patients joined with members of the medical profession, representatives of motoring organizations and of public bodies to pay their grateful tribute to his memory. The esteem in which he was held was evident from the great number who attended, many in advanced years. Much sympathy will be felt for his widow, who had been his constant companion and help for more than forty years, and for his daughter and his son, himself in medical practice in Bournemouth.

S. W. S.

Dr. L. A. Weatherly writes: I first knew Harold Simmons some fifty-five years ago when he was a student at the Royal Infirmary, Bristol, near which I had then been in practice some twelve years. Thirty-one years ago, when I came to Bournemouth, he was one of seven medical men who gave me a kindly and helpful welcome. They were all my juniors and all are now gone except one. During those thirty-one years I have frequently met Harold Simmons. We have never had an unfriendly word, and if I were asked to give my opinion of him as a medical practitioner I, with all sincerity, should say that from my experience of him I looked upon Harold Simmons as the embodiment of medical ethical integrity.

The Rev. W. Yorke Batley writes: My friend Harold Simmons was a representative type of the old-fashioned family doctor, which is perhaps becoming rarer in these days of specialized scientific medicine. As a doctor he was concerned not only with the particular ailment but with the whole personality of his patients, and all his knowledge and his sympathy were ungrudgingly offered them. The consequence was that, as they often put it, they really felt better when he visited them. Speaking as a layman I should say that his cheery, expansive personality, combined with a real clinical flair and an intense personal interest in his patients, gained and kept for him their complete confidence and persistent affection. He retained an open and receptive mind to modern medical and scientific developments to the very end of his long life. Every year he attended refresher courses at the Middlesex Hospital. His profession was his hobby as well as his livelihood, and he dreaded the coming of a time of retired leisure.

GEORGE HENRY BATTERBURY, M.D.

We regret to announce the death on March 3 of George Henry Batterbury of Wimborne after a period of sixty years' practice in that town. Born in 1850, he was educated at King's College, London, and entered the Medical School in 1869, where he had a distinguished career as Warneford prizeman and senior scholar. Taking his M.R.C.S. in 1873, he was house-physician in 1874 and medical registrar in 1875. In the London M.B. examination of the same year he was awarded the University scholarship and gold medal in medicine and the gold medal in obstetrics. From hospital he went direct to Wimborne, where the rest of his life was spent. The funeral service was held on March 7 at Wimborne, of

whose historic Minster he had been a member of the Governing Corporation under the foundation of Queen Elizabeth for many years.

Sir Kaye Le Fleming writes:

Batterbury was one of the last of what may be termed the old school of general practitioners. The advance of medicine and social evolution have made their mark on the conduct of medical practice more deeply in the last half-century than perhaps in any similar period of time. Beginning his career as a country practitioner, driving in all weather over rough country roads intersected by turnpike gates, Batterbury saw the introduction and steady development of modern surgery. Stage by stage he witnessed the advent of local hospitals, the discovery of *x* rays, the development of bacteriology with the use of vaccines and sera. The bicycle, telephone, and, later, motor cars replaced the messenger on foot or horseback, and relieved much of the physical strain of the country doctor's life. Such a life was bound to develop a fine clinical sense, which was the admiration of all his colleagues and the envy of not a few. Batterbury's quiet confidence and self-reliance and his outstanding knowledge of his work soon established him as the leading doctor of the district, and founded the large practice to which he devoted his whole life. He was the trusted colleague and loyal partner in the large firm which now carries on the practice. His single-hearted devotion to his work, and the large claims which it exacted, left him little time for outside interests except in the field of Masonry.

Always a staunch supporter of the B.M.A., he was president of the Dorset and West Hants Branch in 1889 and a regular attendant at its meetings, and gave every encouragement to the writer to serve the Association. He also held office as chairman of the Bournemouth Division in 1922–3. He was the perfect partner, wise in his counsel, rich in the wisdom of experience, sound and safe in consultation, and I look back with happy memory on a partnership of thirty-five years devoid of a single disagreement or misunderstanding. The great traditions of our profession were safe in his hands, and to men like Batterbury the whole profession owes a debt of gratitude too little recognized but none the less outstanding.

JOHN FREDERICK WALKER, M.B., J.P.

By the death of Mr. J. F. Walker, at the age of 63, on February 27, following an operation at the London Hospital, the British Medical Association loses a keen worker and loyal supporter and the borough of Southend-on-Sea a useful citizen and much respected and loved practitioner. In both these spheres of his activities his outstanding personality came to the fore at a comparatively early age.

Born in London, he was educated at King Henry VIII School, Coventry, and at the City of London School, where the early signs of his future oratorical powers were recognized by the award of the John Carpenter medal for elocution. From school he took up his medical studies at the London Hospital, where he was Buxton scholar and held the post of house-physician. While at hospital he was a keen association football player, and he was always proud of the fact that it was during his secretaryship of the club that "The London" won the inter-hospital cup for the first time in its history. In 1903 he settled in partnership at Southend-on-Sea, and it was here that his life's work lay. He soon acquired a reputation as the best type of family practitioner—friend as well as medical adviser. His influence in civic affairs, particularly as they affected the local profession, was soon felt, and as honorary secretary of the South Essex Division of the Association he played an important part in the negotiations in connexion with the newly introduced National Health Insurance Act. In 1925 he was appointed to the Commission of the Peace for the borough. He also held the appointment of police surgeon, being the first to hold that post on the creation of the Borough Constabulary in 1913.

Walker's work for the Association was not confined to the South Essex Division, and in 1924–5 he was elected to the Council, and again in 1930–1. He was first chairman of the newly formed Charities Committee in 1925, and remained a member until 1935. He was particularly keen on this branch of the Association's work, and organized a plan for the collection of funds in the South Essex Division which might well be taken as a model by many other Divisions. He represented the Division at the Annual Representative Meetings in 1912, 1913, 1919, and 1925, and served on many other committees and subcommittees at headquarters. He was chairman of the Division in 1926, and at the time of his death was president of the Essex Branch. During the latter part of the war he became visitor for the Central Medical War Committee, with the rank of Deputy Commissioner of Medical Services, under the Ministry of National Service, and his services received special commendation in a minute passed by the General Purposes Subcommittee on November 27, 1918. From 1929 to 1933 he was a member of the Ministry of Health Joint Advisory Committee on Disciplinary Procedure.

In spite of his many activities he found time for recreation, and although taking to the game fairly late in his life he became a golfer of no mean order. Twice, in 1927 and 1933, he was elected captain of the Rochford Hundred Golf Club, and at the time of his death was one of its trustees. It was a bitter blow to him when arthritis of the hip, which attacked him in the last few years of his life, compelled him to give up the game about which he was so keen. All his life a staunch Conservative, he took a great interest in politics, and in 1935 he was elected chairman of the Southend-on-Sea Conservative Association. Here his powers of oratory were used to great effect, and in this sphere particularly his place will not easily be filled. As an after-dinner speaker and witty raconteur he earned a reputation second to none in the district.

He possessed a very human heart and a very sound judgment, and he will be greatly missed, not only by a wide circle of friends but by many devoted patients, and not least by his professional brethren in South Essex, to whom advice, so often sought, was always so freely given.

Dr. WILLIAM ALEXANDER YOUNG of Mukden died at his home in Edinburgh on February 20, aged 64. He graduated M.B., C.M. at Edinburgh University when 21. These are bald facts concerning an unusually brave and capable man of whom our profession has reason to be proud but of whom it knew little because he always shunned the limelight. A son of the manse, he went straight after graduation to the mission field in Manchuria, and after his thirty-three years' work there became a recognized authority on Chinese affairs. Because of the Boxer rising in 1900, in which he was stoned and nearly lost his life, he joined the Navy for a year, but returned to Mukden in 1902. During its siege in the Russo-Japanese War he succeeded in evacuating from it a party of friends, but returned to it for the sake of the refugees, and nearly died of typhus fever rampant there. He then worked at two

branch hospitals and travelled widely in Manchuria doing dispensary work, and in 1915 joined the staff of Mukden Medical College, founded by Dr. Christie, as many younger men had left for the great war. Again in 1922 he risked his life in an endeavour to stop the civil war between North and South China—and succeeded. On Christie's retirement he became manager of Mukden College, and there lectured on public health, a job for which he had qualified himself by taking his D.P.H. while on furlough in 1911. Under him the College steadily expanded, and when he came home a few years ago for the sake of his children's education he succeeded Christie as secretary to the College. He was untiring and resourceful in his efforts for it, bought an old motor car for £20 and travelled the length and breadth of Scotland on behalf of the Manchurian work, and was specially pleased when he got the licensing bodies at home to recognize Mukden Medical College as an authorized teaching institution for students. He had a statesmanlike vision, and it was no surprise to his intimates that he became special correspondent for the *Manchester Guardian*, and was employed to lecture on Far Eastern affairs to the four Scottish universities. For the latter purpose he made ingenious jigsaw maps of his own design. By his later lectures he raised more than the £4,000 required for the Christie Memorial Chair. But his heart was in Manchuria, and, perhaps all the more because he bemoaned the seizure of the country by the Japanese, he had made up his mind last year to return to the beloved land of his adoption. Notwithstanding the great gifts for which all admired him, and his forceful personality, he was the humblest of men.—J. A.

Dr. JOHN YOUNG MACFADYEN, M.B.E., who died suddenly at the age of 56 on Christmas Eve, 1937, in Charlottetown, had been for the last twenty years a prominent resident in the British West Indies. He was a graduate of Prince of Wales College and Queen's University, and had served for twenty years as medical officer in the Colonial Service in the British West Indies, residing latterly on the island of Nevis. On several occasions he had acted as Colonial Administrator, and in recognition of his services he was created M.B.E. in the New Year Honours in 1930. Dr. Macfadyen joined the British Medical Association in 1925, and belonged to the Leeward Islands Division. He is survived by his widow, one brother, and one married sister.

Dr. JAMES HENRY GILBERTSON of Hitchin, Herts, died suddenly on February 22 at the age of 77. A student at St. Bartholomew's Hospital, he obtained the M.R.C.S. in 1883 and the L.R.C.P. in 1885. In addition to carrying on a busy practice he rendered fine service to the St. John Ambulance Brigade, of which he was ultimately elected an honorary life member and created an Officer of St. John of Jerusalem. He had held the appointments of medical officer of the second district in Hitchin and of the German Convalescent Hospital in that town. He was for some years honorary consulting medical officer to the North Hertfordshire and South Bedfordshire Hospital. He joined the British Medical Association in 1892, and was a representative at the Annual Meetings at Aberdeen in 1914 and London in 1916.

Dr. GEORGE DAVID KNIGHT, who died in Streatham on January 30 after a brief illness, had been a member of the British Medical Association for fifty-one years. Born in Aberdeen in 1861, he received his medical education in that city and in Edinburgh, graduating M.B., C.M. Aberd. in 1882, in which year he was bracketed "student with the highest honours" with Dr. T. Wardrop Griffiths, who is now emeritus professor of medicine at the University of Leeds, their percentage of marks in all their final examinations averaging 95. Dr. Knight proceeded M.D. in 1893, again with the highest honours, his thesis being an original study of movable kidney and intermittent hydronephroses. He then came to London to join Dr. Walter Verdon in practice at Brixton, later removing to Streatham. Highly esteemed by his colleagues, he carried on a large general partnership practice in Brixton and Streatham, and was for some time a medical officer to Brixton Dispensary. He was appointed a Justice of the Peace, and in that capacity had much to do with the care of mental cases, in institutions and elsewhere. Endowed with exceptional professional skill and knowledge in many branches of medicine, his kindly nature and firm integrity won him very many friends in private as well as professional life. In his earlier years he had taken a keen interest in politics, being a strong Liberal in outlook.

By the sudden death at the age of 58 of Dr. JOSHUA BOWER DALTON on February 23 the staff of the Leicestershire County Council have lost a good friend and a very valuable colleague. In his capacity as assistant school medical officer Dr. Dalton was a familiar and popular figure to the school teachers in the county, and his death will be felt very keenly by them. Graduating M.B., Ch.B. at Manchester University in 1905, he was shortly afterwards appointed senior house-surgeon at the Crumpsall Hospital, Manchester. After various other appointments he held a commission in the R.A.M.C. during the late war, and as a result of this service he suffered from an eye defect which, though a distinct handicap, he was able to overcome. He was appointed to the staff of the Leicestershire County Council in 1921, and during the past seventeen years his work brought him into contact with a large proportion of the school population in the county, by whom he was looked upon not only as the school doctor but as a friend.

With the death of Dr. JOHN MACWATT, J.P., of Duns, Berwickshire, on February 24 there passed one of the most widely known medical practitioners in the South of Scotland. He received his medical education in Edinburgh, where he graduated M.B., C.M. in 1878. He then held the posts of house-surgeon to the Royal Maternity Hospital, Edinburgh, and the Edinburgh Royal Infirmary; he was also resident gynaecological assistant to the Glasgow Royal Infirmary. Later he settled in Duns, succeeding his father in practice; he held numerous public health appointments, including those of medical officer for the borough of Duns and for several parishes in the vicinity and police surgeon. When he retired in 1934, after fifty years' service, he was presented with a cheque for £500 as an expression of the gratitude of a large population among whom he had worked and of the very high esteem in which he was held. Dr. MacWatt joined the British Medical Association in 1899, and remained a member until his death. He took great interest in horticulture, and was the author of a book on *The Primulas of Europe*.

Dr. JOHN HARMER DREW of Weston-super-Mare died on February 27 suddenly at his residence in that town at the age of 56. He received his education at St. Thomas's Hospital, and graduated M.B., B.S.Lond. in 1905, obtaining the diplomas M.R.C.S., L.R.C.P. in the same year. He proceeded M.D. four years later. His first appointments included those of house-surgeon to St. Thomas's Hospital, house-surgeon to out-patients and senior casualty officer, and clinical assistant in the Ear Department in the same institution, resident medical officer to the West London Hospital, and resident surgical officer to the North Staffordshire Infirmary and Eye Hospital. During the war he held a commission as captain R.A.M.C., and was a surgical specialist in the British Expeditionary Force. At Weston-super-Mare he was physician to the General Hospital, and carried on a busy general practice. He joined the British Medical Association in 1911, and was a member of the East Somerset Division.

Universities and Colleges

UNIVERSITY OF OXFORD

At a congregation held on February 26 the following medical degrees were conferred:

D.M.—G. R. P. Aldred-Brown (*in absentia*), J. Wright.
B.M.—D. M. T. Gairdner.

UNIVERSITY OF CAMBRIDGE

Professor William Lawrence Bragg, D.Sc., F.R.S., has been elected to the Cavendish Chair of Experimental Physics in succession to the late Lord Rutherford. Professor Bragg is the son of Sir William Bragg, O.M., P.R.S., and held the Langworthy Chair of Physics in the University of Manchester from 1919 to 1937, when he was appointed Director of the National Physical Laboratory.

The following have been examined and approved for the degree of M.Chir.: P. H. R. Ghey, D. N. Matthews, W. F. Nicholson.

UNIVERSITY OF LEEDS

Dr. W. E. Adams has been appointed Lecturer in Histology.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—P. H. Beamish, G. H. L. Bullmore, P. C. Conran, A. W. Frankland, S. J. Nathan, J. R. Rose.

MEDICINE.—F. E. Buckler, E. E. Bullock, G. G. O. Evans, J. B. Good, M. W. Hemans, I. M. Monare, B. Oppenheim, E. S. Reed, A. T. Rogers, G. L. Young.

FORENSIC MEDICINE.—A. Backman, F. E. Buckler, E. E. Bullock, J. B. Good, M. W. Hemans, B. Oppenheim, E. S. Reed, A. T. Rogers, G. L. Young.

MIDWIFERY.—P. H. Beamish, G. E. N. Bird, F. P. S. Malone-Barrett, B. Oppenheim, A. Smith, B. W. S. Spurgin.

The Diploma of the Society has been granted to P. H. Beamish, E. E. Bullock, G. G. O. Evans, A. W. Frankland, J. B. Good, S. J. Nathan, E. S. Reed, A. T. Rogers, and G. L. Young.

The Services

HONORARY PHYSICIAN TO THE KING

Air Commodore Harold Edward Whittingham, C.B.E., has been appointed an Honorary Physician to the King, vice Air Vice-Marshal Sir Alfred William Iredell, K.B.E., C.B., who has relinquished his appointment on retirement.

DEATHS IN THE SERVICES

Surgeon Captain EDMUND CORCORAN, R.N. (ret.), died at Devonport on February 24, aged 79. He was educated in the school of the Royal College of Surgeons in Ireland at Dublin, and took the L.R.C.P. and S.I. in 1880. He entered the Royal Navy soon afterwards, attained the rank of fleet surgeon on February 11, 1900, and surgeon captain on January 6, 1914. He served through the war of 1914–18, receiving the medals. He was in receipt of a Greenwich Hospital pension.

Squadron Leader DAVID EDMUND STODART, D.S.O., D.F.C., R.A.F. (ret.), died at Brighton on February 26, aged 55. He was born in Victoria, Australia, on July 31, 1882, the son of D. E. Stodart, J.P., and was educated at Edinburgh University, where he graduated M.B., Ch.B. in 1910, studying afterwards in the Middlesex and London Hospitals. In 1912 he took up flying, and was appointed second lieutenant in the Royal Flying Corps, Special Reserve, on May 17, 1913. In February, 1914, he was appointed Flying Officer in the R.F.C., and went to France with No. 3 Squadron in August, 1914. He served throughout the war, chiefly in France, later at Aden and in India, was thrice mentioned in dispatches, and received first the Distinguished Flying Cross and later the D.S.O. The latter award was recorded in the *London Gazette* of September 21, 1918, when it was stated that, while in command of a flight of the Royal Air Force, all the other officers in the flight were incapacitated through sickness or wounds, and he carried out their duties in addition to his own administrative work as commanding officer. "In a period of twenty-one days this officer was thirty-seven hours in the air, performing all the duties of an entire flight, a record which it would be difficult to surpass." He was placed on the retired list on March 1, 1931, and became assistant physician in the dermatology department of the Middlesex Hospital. In 1934 he competed in an air race to Melbourne, coming in sixth.

Medico-Legal

THE DEFENCE OF INSANITY

From time to time the criminal courts remind us of the wide gap that exists between the legal view of insanity and the knowledge gained by psychiatrists in the century which has elapsed since the formulation of the "rules in M'Naghten's case." A man recently charged at the Old Bailey with the murder of an elderly woman in a fit of temper pleaded that he was insane when he did the act. The evidence showed that he gave himself up, saying that he had killed two women, and confessed that after he had killed the elder a girl of 12 had come in and he had tied her up and stabbed her with a sharp poker. (He was not charged with the second crime.) His conduct had been peculiar, and one of his grandmothers had died insane. The medical officer of the prison said that the man was sane, and that he could not tell whether he had been sane or insane at the time of the offence. Dr. Denis Carroll said that he thought the man would be certifiably insane in about a year. Lord Hewart, the Lord Chief Justice, said in his summing-up that few things surprised him more than the apparent levity with which juries were sometimes asked to find a fellow creature insane, with all the consequences which being found to be a criminal lunatic involved. (The consequences of being found to be a sane murderer are different but not more desirable.) The same defence was raised by the "Felixstowe" murderer, the mate of a barge who shot his skipper. Counsel on his behalf sought to prove that he was suffering from *mania à potu*, or acute insanity due to a drinking bout. Lord Hewart, as president of the Court of Criminal Appeal, said on February 21 that the defence of insanity requires three things: (1) that at the material time the offender was suffering from a disease of the mind; (2) that because of that disease of the mind he was suffering from a defect of reason; and (3) that because of that defect he either did not know the nature of his acts or did not know that they were wrong. In the Felixstowe case, he said, the so-called defence of insanity did not even begin to establish any one of those three things.

Without the whole of the evidence before us it would be improper even to hint that a wrong decision was reached in either of these cases. The Lord Chief Justice is frequently reported as demolishing the insanity defence with the hard cudgel of the M'Naghten rules. This is his duty, and in doing it he invariably displays absolute fairness. It does, however, seem anomalous that the law of criminal responsibility should leave out of account altogether the grave contributions which mental disorder makes to the commission of an act of violence, and the extent to which it often destroys real responsibility without bringing the patient within the M'Naghten rules. To the enlightened medical mind of to-day the act of murder is more often than not the culminating explosion, or crisis, of a long series of events for which the murderer is only in part, and sometimes hardly at all, responsible. Our civilization has not yet quite grown out of retributive human sacrifice.

No. 8

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 26, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 125 great towns (i) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns (ii) in Eire. (e) The 10 principal towns (iii) in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	29	6	9	1	—	15	3	12	2	—		
Deaths		2	1				1	5				
Diphtheria	1,565	152	226	62	34	1,252	155	223	60	38	1,259	158
Deaths	34	3	5	4	—	26	1	5	1	—		
Dysentery	214	62	58		—	21	4	39		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	4	—	—		—	8	1	4		—		
Deaths		—					2					
Enteric (typhoid and paratyphoid) fever	18	1	5	3	3	45	7	23	7	—	30	—
Deaths	1	—	—	—	—	4	—	—	—	—		
Erysipelas			71	10	7			80	9	2		
Deaths		2					2					
Infective enteritis or diarrhoea under 2 years												
Deaths	66	22	4	5	2	43	11	10	5	2		
Measles			1,653		295*			92		5		
Deaths	50	13	22	4	19	7	1	1	3	—		
Ophthalmia neonatorum	115	11	55		1	71	4	37		—		
Deaths												
Pneumonia, influenzal§	1,188	83	6	11	15	1,372	101	60	28	7	1,641	150
Deaths (from Influenza)	59	11	4	1	3	242	23	23	19	8		
Pneumonia, primary			243	7				227	4			
Deaths		24		45	18		20		24	13		
Polio-encephalitis, acute	1	—				2	—					
Deaths		—					—					
Poliomyelitis, acute	6	—	—		—	4	—	—		—		
Deaths		—					—					
Puerperal fever	4†	4	13	2	—	53	9	19	4	—		
Deaths		—					2‡					
Puerperal pyrexia	184	12	16		6	107	11	26		—		
Deaths												
Relapsing fever	—	—	—		—	—	—	—		—		
Deaths	—	—	—			—	—	—				
Scarlet fever	2,429	198	459	90	87	1,619	195	309	82	34	1,895	250
Deaths	2	—	1	—	—	5	1	2	—	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	4	—		
Deaths	—	—	—	—	—	—	—	—	—	—		
Whooping-cough			40		13			763		3		
Deaths	16	2	—	2	2	31	10	17	5	3		
Deaths (0-1 year)	472	77	71	60	31	468	89	89	42	26		
Infant mortality rate (per 1,000 live births)	79	63				75	74					
Deaths (excluding stillbirths)	5,609	1,078	745	241	208	5,384	1,031	812	272	191		
Annual death rate (per 1,000 persons living)	13.8	13.6	13.8	16.3	18.4	13.4	12.8	15.1	18.5	18.3		
Live births	6,870	1,298	900	438	258	6,228	1,175	864	301	220		
Annual rate per 1,000 persons living	16.9	16.3	18.4	29.6	22.9	15.5	14.6	17.7	20.5	21.1		
Stillbirths	267	36				277	44					
Rate per 1,000 total births (including stillborn)	37	27				43	36					

(i) 122 great towns in 1937.
(ii) 12 „ „ „ „
(iii) 9 „ „ „ „

* 281 cases in Belfast alone.
† After October 1, 1937, puerperal fever was made notifiable only in the Administrative County of London.

‡ Deaths from puerperal sepsis.
§ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Small-pox

Small-pox was introduced into this country on Friday, March 4, when the P. and O. liner *Cathay* arrived at Tilbury with a patient suffering from an attack of the severe type of small-pox (variola major), from which he died seven days after arrival. An appeal by broadcast on the same evening was made requesting all passengers who had left the ship to communicate forthwith with the medical officer of health in the district in which they were staying. A case of small-pox, apparently of the mild form (variola minor), has been notified at Leighton Buzzard in a girl aged 5 years. The diagnosis has been confirmed since admission to hospital.

Typhoid Fever

There have been 42 cases to date in the outbreak of typhoid fever in Somerset, with 7 deaths. In Pembrokeshire an additional death from typhoid occurred last week, bringing the total number to 10.

Diphtheria and Scarlet Fever

Diphtheria continues to decline slightly in all five areas from which notification returns are made, but the numbers notified are still in excess of the median value for the last nine years for England and Wales, and very much in excess of the figures for the corresponding week last year, which were lower than the median value. In London the number is slightly less than in the corresponding week last year and than the median value for the last nine years. On the other hand, scarlet fever appears to be on the increase in England and Wales and Northern Ireland, while in Scotland—459 against 490 last week—and in Eire—90 against 100 last week—there has been a decrease. The increase of notifications in England and Wales is due more to a general rise over a wide area than to the presence of local outbreaks or epidemics. Thus in Devon there were 26 (16) notifications, of which 8 (1) occurred in Paignton; in Durham county there were 107 (90), of which 13 (8) were in Chester-le-Street; in Kent 72 (46) cases were notified, the increase being scattered over the whole county; in Lancaster there were 359 (97); in Liverpool 98 (80); in Manchester 73 (59). In Surrey there were 64 (43) notifications, the increase being scattered over the whole county. The figures in parentheses denote the numbers notified in the previous week. During the same week there were 198 cases in London, a number which remains less than the median value of 250. During the week under review there were no deaths from scarlet fever in London, Dublin, and Belfast. While there was a general decrease in the notifications in Scotland as a whole, 190 cases were notified in Glasgow, an increase of 2 over the previous week, with 1 death; in Edinburgh there were 50 cases (an increase of 7 over the previous week).

Measles

An increase in the numbers of cases of and deaths from measles has to be reported in the week under review: in the Great Towns 50 deaths were recorded compared with 31 in the previous week; of these 13 occurred in London, 2 in Manchester, 1 in Liverpool, 3 in Salford, 3 in Wigan. Details are available of the spread of the London epidemic: thus, 1,801 cases of measles were reported in the L.C.C. elementary schools, compared with 1,551 in the previous week, and the daily admissions to the L.C.C. fever hospitals were 68, compared with 61 for the previous week. Notifications for Bermondsey, Shoreditch, Southwark, and Stepney for the week under review—that is, ending February 26—are 38, 11, 178, and 42 respectively. In Scotland 1,653 cases were notified compared with 1,691 in the previous week: the figures for Glasgow being 1,264 (19), Edinburgh 112 (3), Paisley 118, Dundee 26, Aberdeen 15. The figures in parentheses denote deaths. In Northern Ireland there were 259 cases, compared with 384 in the previous week: the figures for Belfast were 281 as against 362, while the deaths were 17, compared with 20 in the previous week. During the week 4 deaths from measles were recorded in Dublin.

Typhus in Morocco

Although typhus prevails in endemic form in Tunis, Algeria, and Morocco, returns received show that there was a noteworthy increase in the incidence in these countries during the winter of 1936–7. This winter the increase has been greatest in Morocco, the epidemic starting in late November or early December in Marrakesh. At the beginning of December, although the actual number of cases reported had not been large, the authorities recognized the danger of a rapid spread in a town of the type of Marrakesh, and made arrangements for the vaccination of large numbers of the native population. It was claimed that by the middle of January over 150,000 had been vaccinated. It was stated that the vaccination is not employed for Europeans as they do not stand it well, and it is noteworthy that the incidence of the disease among Europeans has been relatively high. The accompanying table shows the incidence in the Marrakesh district week by week. The majority of cases occurred in the district round Marrakesh, the figures received to date for the town of Marrakesh being 65 cases in December and 75 cases in January. On January 7 it was reported that a focus had appeared at Taroudant and in surrounding native encampments. Two fatal cases occurred in British subjects in this town.

Typhus in Marrakesh District

	9/12/37	16/12/37	23/12/37	30/12/37	6/1/38	13/1/38	20/1/38	27/1/38	3/2/38	10/2/38	17/2/38
Cases ..	183	182	267	150	3	130	106	93	100	148	134
Deaths..	22	17	14	66	0	41	30	11	10	20	19
European cases .	4	9	11	0	1	8	9	24	7	16	6
European deaths	—	1	1	2	0	2	3	2	8	3	1

Casablanca is also affected, the number of cases reported in the area during December being 78 and during January 173. Of these only 6 and 15 respectively occurred in the town of Casablanca itself. On January 12, however, it was reported that there was a serious outbreak in the town. No actual figures are available up to date, but it is stated that the authorities regard the situation with apprehension and are inaugurating extensive vaccination and other precautionary measures.

During January and the first half of February, 24 cases were reported in Fez. It is stated that a number of these are in persons coming from Marrakesh and other parts of Morocco.

On the occasion of the International Congress in Budapest in 1909 the International Medical Postgraduate Committee was formed. This committee held its second session during the International Medical Congress held in London in 1913. In August, 1937, an international medical postgraduate congress was held in Berlin, at which forty-four nations were represented, and the organization of an International Medical Postgraduate Academy in Budapest was decided upon. The next session will take place on April 24, 1938, when a series of lectures will be delivered by foreign savants under the heading "Research and Postgraduate Training." The arrangements are in the hands of the Hungarian Medical Postgraduate Committee, under the presidency of Professor Emile de Grósz. Address: Budapest, VIII, Üllöi-ut, 26.

Medical Notes in Parliament

The second reading of the Collecting Charities (Regulation) Bill was set down in the House of Lords for this week. On March 8 the Blind Persons Bill and the Population (Statistics) Bill passed through committee. The Dogs Act (1871) Amendment Bill (which provides that there should be an appeal from a court of summary jurisdiction to Quarter Sessions against an order for the destruction of a dog) was read a second time in the House of Lords on March 8, as was the National Health Insurance (Amendment) Bill.

The House of Commons discussed defence policy and Supplementary Estimates for Palestine and Colonial Services. The Army Estimates were also to be considered.

The Housing (Financial Provisions) Bill passed through committee in the House of Commons on March 3. On March 7 the Registration of Stillbirths (Scotland) Bill was read a second time, and sent to a standing committee.

A New Borstal Institution

In Committee of Supply in the House of Commons on March 1, on the Vote for Prisons in England and Wales, Sir SAMUEL HOARE said that a supplementary estimate was required for the provision of another Borstal institution, which was needed at once. It was proposed to take over the former London County Council centre for the unemployed at Hollesley Bay, Suffolk. It had been found that their efforts to increase the self-reliance and feeling of responsibility of the boys succeeded better if they dealt with them in small groups. At Hollesley Bay it was proposed to divide the boys into four or five units, each of them run on what was called at schools the "house" system, and all of them open to the country and not enclosed by high walls. There would eventually be about 300 boys at Hollesley Bay, but it was proposed to start on a smaller scale. It was desirable not only to get away from the old penal conditions but from the old penal terminology.

After debate, Mr. GEOFFREY LLOYD said that there would be no steps taken for psychological treatment at the new colony, for that work was centralized in the boys' prison at Wormwood Scrubs. The Home Office expected a report to be made very shortly on that work, when the whole subject would be reconsidered. Although they all knew now that a certain number of specially difficult cases did respond to psychological treatment in an extraordinary way, there were failures—as must be expected. Most of the boys did not need psychological training, but would respond to the ordinary common-sense instructional methods that were used at the Borstal institutions. There was now a scheme under which a proportion of the housemasters in Borstal institutions—and this would apply to the colony—were being trained, at the Institute of Industrial Psychology, in vocational guidance. They would have to that extent psychological training, which would be useful. The Home Office welcomed this new colony as a place where experiments could be carried out, notably in the direction of increased responsibility for the boys.

The Vote was agreed to.

Registration of Stillbirths in Scotland

Major NEVEN-SPENCE introduced in the House of Commons on March 2 a Bill to provide for the registration of stillbirths in Scotland, and it was read a first time. Its backers included Dr. Howitt and Mr. Graham Kerr. Major Neven-Spence said the Bill was not intended to deal with miscarriages, whether criminal, legal, or brought about by natural causes. Scotland, almost alone among civilized nations, did not provide for registration of stillbirths. In England stillbirths were registered and entered into the computation of the maternal mortality rate. There was therefore no true comparison between the English and the Scottish rates. A recent report from the Committee on Health Services in Scotland made a specific recommendation for registration of stillbirths. Those in charge of public health administration in Scotland held that the information so obtained might throw light on the causes of the wastage of infant life, on maternal mortality, and on puerperal sepsis. Scotland, with some of the finest medical schools in the world, had an infantile mortality rate nearly thrice that of New Zealand, and the maternal mortality rate in Scotland showed no sign of decrease at 6 per 1,000.

Mr. BUCHANAN said he and his friends reserved the right to oppose the Bill.

Criticism of the B.M.A.'s Milk Advertisements

On March 7 Mr. GARRO-JONES asked the Minister of Agriculture whether he was aware that the expenditure of the Milk Marketing Board on advertising the merits of milk was being largely countered by an advertising campaign sponsored by the British Medical Association, in which all milk which had not been treated by certain methods was stigmatized as dangerous to health; whether he was aware that statements in these advertisements were damaging the interests of farmers producing and selling milk which, though not treated by the methods favoured by the Association, was accepted by the Ministry as of satisfactory quality; and whether he would recommend to the Milk Marketing Board an advertising policy which would neutralize the damage done to the industry by unsubstantiated statements sponsored by private interests. Mr. W. S. MORRISON said he had no information whether the advertisements referred to had had the effect ascribed to them, and he did not think that any useful purpose would be served by suggesting to the Milk Marketing Board that they should change their present advertising policy, which was designed to encourage the consumption of milk generally.

Mr. Garro-Jones said that as the Minister did not appear to appreciate the repercussions of this advertising campaign, he (Mr. Garro-Jones) would raise the matter on the motion for the adjournment of the House at the earliest opportunity.

Mr. MACQUISTEN: Will the Minister inquire who supplied the money for these costly advertisements? It is not the doctors, I presume. (An hon. member: "The distillers.")

Sickness among the Insured Population.—Sir KINGSLEY WOOD, answering Mr. Harold Macmillan on February 24, said statistics showing the incidence of sickness among women and girls in the insured population of England and Wales were not available in his Department and could be obtained only by reference to the detailed records of the 7,000 approved societies and branches which administered health insurance benefits. He was considering the question of a comprehensive investigation into the extent and incidence of various forms of incapacitating sickness among insured persons of each sex and at various ages.

Welfare Authorities and Dried Milk.—On February 24 Sir KINGSLEY WOOD said he did not know that advertisements were being sent to maternity and child welfare committees from firms manufacturing dried milk urging them to supply these patent products on the grounds that they could not be used for general purposes. In some instances dried milk was supplied by welfare authorities on the recommendation of their medical officer of health where this appeared desirable on medical or other grounds. The choice must be one for the discretion of the welfare authorities concerned.

Deaths from Vaccinia in 1937.—Sir KINGSLEY WOOD stated on March 1 that no deaths from small-pox were registered during 1937 in England and Wales. Nine death certificates were received during the year 1937 on which death was attributed entirely or in part to vaccination, post-vaccinal encephalitis, or vaccinia. The ages of the persons concerned were respectively 3 months, 4 months (four cases), 5 months, 7 months, 14 years, and 24 years. All the deaths except that of one child of 4 months had been assigned to the vaccinia class.

Vaccination Regulations at Woolwich Arsenal.—On March 1, in reply to Mr. Leach, Mr. HORE-BELISHA said that instructions would be issued that, except in the event of a small-pox epidemic, persons under 21 years of age were not in future to be required to be vaccinated or revaccinated before entering civilian employment at the Royal Arsenal, Woolwich, or other War Department establishment in this country. Similarly, in the case of boys enlisting in the Army schools, vaccination or revaccination would not be required on enlistment or entry.

Birth Rates in Certain Occupational Groups.—Sir KINGSLEY WOOD said on March 3 that the Registrar-General's report upon occupational birth rates in 1931 was not yet complete. He could give certain advance figures for England and Wales as follows:

Occupational Birth Rates, 1931

	Crude live-birth rate per 1,000 married males under 55 years of age
All married males (including unoccupied) under 55 years of age	95.9
Clergymen (Anglican)	70.5
Teachers	59.9
Professional occupations (excluding clerical staff)	73.5
Social Class III, skilled workers	95.3
Social Class V, unskilled workers.. ..	122.2

Notes in Brief

During 1937 extensions of stay were granted to 813 foreign professional men and women who had arrived during the last three or four years. These included sixty-six dentists and 181 doctors, and nearly 300 research workers.

Mr. W. S. Morrison hopes that legislation to give effect to the proposals contained in the Government's White Paper on milk policy will be introduced shortly after the Easter Recess.

Only the Corporation of Sheffield has by a local Act power to deal generally in milk. Five other local authorities have a limited power to sell prepared milk for infants.

Medical News

The Tavistock Clinic, Malet Place, W.C., announces with regret that owing to illness Professor Jung will be unable to give the four seminars at the Clinic which were to have been held on April 4, 5, 7, and 8. Professor Jung has had to cancel all his engagements, but hopes, if his health permits, to carry out the programme originally arranged during the week October 3–7.

The annual dinner of the Medical Superintendents' Society will be held on Saturday, March 19, at the Langham Hotel, London, W., at 7.15 p.m.

A meeting of the Society of Medical Officers of Health will be held at 1, Thornhaugh Street, Russell Square, W.C., on Friday, March 18, at 5 p.m., when there will be a discussion on "Hospital Policy in Relation to Preventive Medicine," to be opened by Dr. Arthur Massey and Dr. James Ferguson.

The next clinical meeting of the Society of Radiotherapists will be held at 11, Chandos Street, W., on Friday, March 18, when there will be a discussion on "Methods of Measuring and of Recording Dosage," to be opened by Drs. Stebbing, Paterson, Windeyer, and Clarke.

A meeting of the Chelsea Clinical Society will be held at the Hotel Rembrandt, Thurloe Place, S.W., on Tuesday, March 15, at 8.30 p.m., when Dr. A. F. H. Coke will open a discussion on "Sedimentation Tests in Rheumatism." The meeting will be preceded by dinner at 7.30 p.m.

On Saturday, March 26, at 8 p.m., a demonstration of men's and women's recreative gymnastics will be given in the Albert Hall, London, under the auspices of the Central Council of Recreative Physical Training. Lord Stanhope, President of the Board of Education, will speak, and Lord Aberdare will take the chair. Tickets at various prices may be had from the Anglo-Swedish Society, 10, Staple Inn, W.C.1.

The sixty-second congress of the German Society of Surgery will be held in the Langenbeck-Virchow House from April 21 to 24. A conjoint meeting with the German Society for Orthopaedics, Industrial Accidents, and Insurance Medicine will be held on April 22.

The German Society for Internal Medicine will hold its fiftieth annual meeting from March 28 to 31 at Wiesbaden in conjunction with the German Society for the Study of Children's Diseases, under the presidency of Professor Assmann of Königsberg. The following subjects will be discussed: examination of cardiac function, function and diseases of the suprarenals, vitamin B_2, and acute inflammatory diseases of the central nervous system. Further information can be obtained from Professor Assmann, Schubertstrasse 19, Königsberg.

The February number of the *Journal of Nervous and Mental Disease* publishes Paul Schilder's "Psychoanalytic Remarks on *Alice in Wonderland* and Lewis Carroll." When his paper condemning this children's classic as a sadistic fantasy was read before the American Psychoanalytic Association in December, 1936, it provoked a storm of discussion in the newspapers.

The January issue of the *Medico-Legal and Criminological Review* has appeared in a new shape which is easy to handle and pleasant to the eye. It is proposed in the future to increase the scope of this journal, which in addition to publishing the papers read before the Medico-Legal Society will include articles of general interest to members of both the legal and the medical professions.

The February issue of the *Bulletin de l'Office International d'Hygiène Publique* contains articles on yellow fever by Colonel S. P. James, president of the Yellow Fever Committee, Professor Ricardo Jorge, the delegate of Portugal, Dr. van Campenhout, delegate of the Belgian Congo; and on chronic rheumatism by Drs. R. J. Weissenbach and F. Françon of the French Ministry of Health.

A dramatized life of Oliver Wendell Holmes, "an American of many attainments," was broadcast by *Cavalcade of America* on February 9. The first scene introduces him as a law student of 21 at Harvard, writing his stirring poem "Old Ironsides," which aroused public sentiment, saved the most famous ship in the history of the U.S. Navy from being scrapped, and brought him national fame. He is next depicted battling with his own profession over the contagiousness of puerperal fever. We meet him again at the "Mutual Admiration Society," the Boston Saturday Club, which the "Autocrat of the Breakfast-Table" enchanted with his wit and urbanity. The play closes with Holmes reading his last poem at the breakfast given in honour of his seventieth birthday.

The Léon Bernard Foundation of the International Union against Tuberculosis announces that the biennial prize of 2,500 francs in memory of Professor Léon Bernard will be awarded in 1938. The subject for competition is "Social Aspects of Tuberculosis." The articles, which must be written in French or English and not exceed 10,000 words, should be sent to the secretary of the International Union against Tuberculosis, 66, Boulevard Saint-Michel, Paris VIe, before May 1.

The King has granted Dr. Charles Albert Bentley, C.I.E., authority to wear the Insignia of Commander of the Order of the Nile, conferred upon him by the King of Egypt in recognition of valuable services.

Sir Harold Gillies has been nominated a corresponding member of the Berlin Medical Society, before which he read a paper on plastic surgery on February 9.

March 5 marked the centenary of the birth of Gustav Theodor Fritsch, who died on June 12, 1927, the collaborator with Hitzig in the discovery of the motor cells of the cerebral cortex in 1870.

The Jugoslav State has allotted a sum of four million dinars to the Jugoslav Society for the Scientific and Social Campaign against Cancer to enable a cancer institute to be formed at Belgrade.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

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The TELEGRAPHIC ADDRESSES are
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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Hormones for Enlarged Prostate

Dr. S. (Bombay) writes: A physician, aged 55, is suffering from hypertrophy of the prostate. Can anyone give his experience of injections of testosterone propionate and pituitary hormones in such cases? How much of the testicular hormone should be injected, and how often? Should the pituitary hormone be given at the same time as or after the injections of testicular extract? Does this treatment obviate the need for operation?

Glycosialia?

Dr. ISOBEL G. SMITH writes: A female patient of mine, aged 70, is complaining of an almost constant sweet taste in the mouth. The condition began about a year ago, but at that time only occurred some time after a meal. The dentures which she wears become covered with a sort of sticky adherent film, in spite of washing them after eating food. The gastric juice is normal and the bowels are kept regular. A catarrhal condition of the nasopharynx was dealt with and frequent mouth washes and paints have been used, but the patient continues to complain bitterly of the disagreeable taste. I would be most interested to know if anyone can suggest a cause, and, more especially, a treatment.

Incapacitating Diarrhoea

"D. G. O.," in reply to "Emdee" (*Journal,* December 11, 1937, p. 1206), writes: I suggest that "Emdee" takes one drachm of acid. hydrochlor. dil. in a wineglassful of water or lemonade, thrice daily, after meals. This very simple prescription has proved effective in a similar case of unexplained diarrhoea.

Primary Vaccination

Dr. C. LUTHER BATTESON (Watford) writes: I am in agreement with Dr. S. H. de G. Pritchard (*Journal,* March 5, p. 550) when he expresses the opinion that post-vaccinal encephalitis is largely due to the use of rabbit lymph. So far as my recollection goes these cases were not met with until some bright economist thought of using animals other than calves for the supply of lymph.

Income Tax

Employment of Maidservant

"SIGMA" asks: "What is the usual amount allowed in respect of a maid's help?" Hitherto he has been allowed £80 per annum, but the inspector of taxes wants to restrict it to £52 in future.

*** It is difficult to offer any general guidance because so much depends on the particular circumstances. The amount must have regard to (*a*) the total cost (including board, laundry, etc.) of the domestic staff, and (*b*) the proportion which relates to the professional side—looking after the waiting room and surgery, attending on callers, etc. In our experience where two maids are kept an allowance of £100 per annum is not uncommon.

LETTERS, NOTES, ETC.

Human Embryos Wanted

Dr. MARY CRIPPS writes: I am doing a piece of research on human embryos, and find it very difficult to obtain specimens, especially the early ones. Those I particularly need are embryos of the sixth week of pregnancy. I would like them put in very weak formalin (2 or 3 per cent.). Readers of the *Journal* who are kind enough to send specimens of this age should address them to me at the Histology Department, Royal College of Physicians, Forest Road, Edinburgh. They must be packed in accordance with Post Office regulations.

Hydrotherapy for Rheumatoid Arthritis

"CRIPPLED" writes: With regard to the question raised by Brigadier-General F. E. Burnham as to the advisability of giving hydrotherapy in the acute stage of rheumatoid arthritis (*Journal,* February 5, p. 308), may I suggest that it is perhaps, as he has found, not hydrotherapy which should be avoided, but rather the application of heat without water. No doubt each patient reacts differently, but the following facts are from my own personal experience. In the first place, ordinary "reclining baths" with the water at a scalding temperature, in which I lay until I felt faint—that is, for about ten minutes—followed by a cold sponge, relieved pain and stiffness, but only for a few hours. Secondly, radiant heat applied to the limbs immediately produced a violent exacerbation of the symptoms. Thirdly, steam vapour baths produced a gradually cumulative damage with disastrous final results. In these baths the whole body except the head was exposed to both radiant heat and steam vapour. Finally, hot weather often increased the severity of the pain. In my own case the relief afforded by heat when applied through water was nearly as remarkable as the exacerbation of the pain when heat was applied without it.

Disclaimers

Dr. GEOFFREY KONSTAM writes: In an article in a daily newspaper on March 1 concerning an operation on a hospital patient of mine suffering from Pick's disease mention was made of my name and address. I was greatly distressed on reading this article, which was written without my knowledge or consent, and I took immediate steps to prevent a repetition of such unwanted publicity. The information was apparently given to the Press by a member of the patient's family, and I was unaware of it until the article was shown to me after publication.

Mr. FRANK J. P. O'GORMAN (Doncaster) writes: A recent article in the local Press makes reference to one of my cases in which an intracardiac injection of adrenaline was given. The report was of certain proceedings where, on behalf of others, I made a presentation to a retiring midwife. Through the courtesy of your columns I would like to disclaim any connexion with the ridiculous sensationalism of the report about this case.

Corrigenda

Drs. Jenkinson and Milne wish to draw attention to an error in their article on "Insulin-Tannic-Acid-Zinc Suspension in Treatment of Diabetes Mellitus," published in our issue of February 19. The end of the last sentence in paragraph three (page 381, sixth line of first column) should read: "with the addition of zinc, 1 *milligramme* to 500 units of insulin"—not "1 gramme to 500 units."

In the *Journal* of March 5 we published at page 504 an article by Dr. A. Morton Gill on "Pneumonitis." At page 507, under paragraph (*f*), "suffering from chorea and rheumatic carditis complicated by pneumonia" should have read, "suffering from chorea and rheumatic carditis complicated by pneumonitis."